

PC

The Independent Guide to
IBM Personal Computers

Volume 2 Number 6
November 1983 \$2.95

ON THE IBM ASSEMBLY LINE

IBM NETWORKS: Which Ones Fly?

Trading Commodities
by Computer

Reviews: VisiWord
and WordPerfect

Software for the
Classroom

Transferring
Apple Files

WordStar
Learning Aids

Controlling your
Videodisk Player

SCAMP: The
First IBM Micro



History will record as a profound irony
that the most powerful word processing package
ever created for the IBM® Personal Computer
wasn't created by IBM.

LEADING EDGE.®

LEADING EDGE PRODUCTS, INC.
FORTUNE 1300 DIVISION
21 HIGHLAND CIRCLE
NEEDHAM HEIGHTS, MA 02194
(617) 449-6762 1-800-343-3436

HEADQUARTERS & RETAIL DIVISION
225 TURNPIKE STREET
CANTON, MA 02021
(617) 828-8150 1-800-343-6833

THE SECRETS OF PERFECT MEMORY:
ONE AND ONE HALF EARTH DOLLARS

AT LAST: THE WHOLE
TRUTH ABOUT FLOPPIES.

Amazing book reveals
all!

How to keep from
brainwashing your disk
so it never loses its
memory.

How fingerprints can
actually damage disks.
Unretouched Kirlian
photographs of UFO's
(Unidentified Floppy
Objects)! The incredible
importance of making
copies: the Department
of Redundancy Depart-
ment--and what goes on
when it goes on! Power-
ful secret methods that
scientists claim can ac-
tually prevent computer
amnesia! All this, and
much more...

In short, it's an 80-
page plain-English,
graphically stunning,
pocket-sized definitive
guide to the care and
reeding of flexible disks.

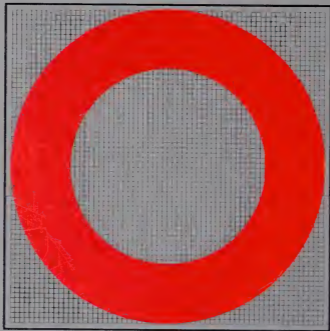
For The Book, ask your
nearest computer store
that sells Elephant™
disks, and bring along
one and one half earth
dollars.

For the name of the
store, ask us.

**ELEPHANT MEMORY
SYSTEMS®** Marketed
exclusively by Leading
Edge Products, Inc.,
Information Systems
and Supplies Division,
55 Providence Highway,
Norwood, MA 02062. Call
toll free 1-800-343-8413.
In Massachusetts, call
collect (617) 769-8150,
Telex 951-624.



TESTED TWICE. GUARANTEED FOREVER.



Introducing Wordsworth™ flexible disks—the most reliable disks ever tested.

Twice.

First, every single Wordsworth disk gets hit with a barrage of rigid quality-control tests to make sure we meet or beat every technical spec demanded by the people at ANSI and ECMA.

But, since very few things in this world are perfect (including tests), we test every single disk again, for exactly the same criteria. And only if a disk is second-time certified 100% error-free is it pronounced worthy of the name Wordsworth.

Which is about as synonymous

as possible with "perfect."

Which, in turn, means you'll have an easy time answering questions like: Is every inch of every track certifiably 100% error-free? Will it play back exactly what you fed in, without missing a single bit? Every time? From now until death and taxes are eliminated?

And then we have a very simple rule: If the disk doesn't check out, it gets chucked out.

Why do we go to all this bother?

Because, very simply, Wordsworth is the world's newest major brand, created and tested with the world's newest and best technology. It's a premium product that

will become the world's most widely used disk for absolutely critical information applications.

Our disks come in 5¼" and 8" sizes, in virtually every configuration, for compatibility with virtually every microcomputer on the market. Unlike any other disks in the industry, every one is tested twice; so, unlike anyone else in the industry, we can guarantee them not for 30 days or 90 days or even 5 years ... but forever.

And forever, as you may have heard, is a long, long time.

WORDSWORTH

**LEADING
EDGE.®**

Distributed exclusively by Leading Edge Products, Information Systems and Supplies Division, 55 Providence Highway, Norwood, MA 02062. Dealers: Call toll-free 1-800-343-8413; or in Massachusetts, call collect (617) 769-8150.

CIRCLE 280 ON READER SERVICE CARD

ZERO TO MULTIPLAN™ IN 5.2 MINUTES.

FINANCE OR ACCOUNTING WORKSHEETS FAST.



Gentlemen, start your computers.

Time: 0



Select budget intervals.

Time: 0.5



Enter sales revenue.

Time: 1.0



Enter selling expenses.

Time: 1.5



Your sales budget on the Multiplan electronic worksheet—in record time.

Time: 5.2

and build financial or accounting worksheets tailored to your specific needs. In minutes.

You won't have to worry about developing formulas or formatting screens to build your Multiplan worksheets. Because the expert systems literally do it for you.

For example, the Multi-Tool Budget expert system creates seven inter-related

Multiplan worksheets for a total budget planning and control environment.

What's more, each system is developed by experts: business professionals and leading authorities in finance and accounting.

You'll benefit from their knowledge immediately, through the powerful worksheets each Multi-Tool expert system builds for you. And with the sophisticated tutorial manuals that accompany each system. Each manual provides in-depth information about both the design of the worksheets and the areas of finance and accounting they cover.

The result: a tailored electronic worksheet that helps you make high quality decisions.

That's just what you'd expect from Microsoft. The people who let you concentrate on your business rather than on your computer.

Ask your computer dealer to let you test drive the new Multi-Tool expert systems. Better tools that help you put your business in first place.



THE MULTI-TOOL EXPERT SYSTEMS. A POWERFUL ADDITION TO THE MULTIPLAN ELECTRONIC WORKSHEET. Available now. The Multi-Tool Budget expert system. The Multi-Tool Financial Statement expert system.

BETTER TOOLS FOR MICROCOMPUTERS

MICROSOFT™

Microsoft is a registered trademark, and Multi-Tool, Multiplan and the Microsoft logo are trademarks of Microsoft Corporation.

the Apple-IBM connection



Upgrade Your Apple VisiCalc Models to IBM 1-2-3.

For thousands of computer users across the nation, the Apple-IBM Connection™ is the simple, reliable way to transfer all kinds of spreadsheet files between Apple II's™ and IBM PC's.™

Because unlike any other transfer method, only the Apple-IBM Connection accurately transfers everything — including formulas — precisely the way they were written on one computer to exactly the way they should be on the other.

No retyping. No reformatting. No errors or omissions.

So what started out as a fully developed spreadsheet on your Apple ends up as the same spreadsheet on your IBM PC. Now you can transfer Apple VisiCalc files to the powerful second generation spreadsheets, including 1-2-3,™ MultiPlan,™ IBM VisiCalc,™ and VisiCalc IV.™ And to integrated environments like Visi-On.™

And it works equally well with ASCII, database, word processing and source code files.

Start transferring files the easy, sensible way. With the new Apple-IBM Connection from Alpha.

Call us today toll free at 1-800-451-1018 (in Massachusetts call 1-617-229-2924 collect) for the name of the Alpha Software Dealer nearest you.

System Requirements:

Apple II + or Apple IIe with 64K and one of the following:

- Hayes Micromodem II
 - Mountain CPS Card
 - CCS Card (model 7710)
 - Apple Super Serial Card
 - IBM PC or XT with 96K and any RS-232 card.
- The new Apple-IBM Connection also supports external Hayes Smartmodem and acoustic modems.

The Apple-IBM Connection — \$250.

alpha
SOFTWARE CORP.

30 B Street
Burlington, MA 01803

™& alpha® signifies Manufacturer's trade mark.

INTRODUCING DATA BASE MANAGER II™ FROM ALPHA.

IT'S FOR PEOPLE WHO HAVE THEIR OWN IDEAS ABOUT WHICH SOFTWARE SHOULD BE INTEGRATED.



Here's a proposition for you.

First thing tomorrow, throw out at least one of your favorite computer programs. Maybe your word processor. Maybe your spreadsheet. Maybe both. Just make sure it's something you like, and that you've spent some time learning it.

Now, start from scratch with programs you don't know. Ones that force you to give up features you depend on now.

Interested?

Well, if you plan to get in on the current "integrated" software rage, that's what you'll have to do. Because most integrated software systems only work with software from one manufacturer.

If you think that's too much to ask, then Data Base Manager II from Alpha is for you.

It starts by giving you an enormously powerful and elegantly approachable data base system. One that's menu driven and responds to simple, English-like commands. But one that's also truly fast. With all the advanced features you'd expect from a top-notch data base management system.

Plus, you get extended DBMS features like phonetic word search, built-in form letter, and date calculations. And a painless way to file data transferred to your PC from other micros, mainframes or information utilities.

And then it lets you do something else. It lets you totally integrate your word processor, and your spreadsheet program, instantly.

So you can quickly call up and manipulate any information. Then move it over to VisiCalc,® 1-2-3,® or Multiplan,™ for calculations. Then shuffle it over to WordStar,® EasyWriter,® or Volkswriter™ for

word processing. Without re-entering data. And without complex commands.

In fact, Data Base Manager II lets you integrate nearly any combination of the word processing and spreadsheet programs that run on the IBM PC or XT.

The prestigious software journal, *The Rosen Electronics Letter*, says Data Base Manager II's unique capabilities "unify some of the best of the productivity packages already on the market... This is a signal achievement."

You'll say that this is the way personal computing is supposed to work in the first place.

See the remarkable new Data Base Manager II today. Call us toll-free at 1-800-451-1018 (in Massachusetts call 1-617-229-2924 collect) for the name of the Alpha Software Dealer nearest you.



DATA BASE MANAGER II™ FROM

alpha
SOFTWARE CORP.

12 New England Executive Park, Burlington, Massachusetts 01803

TM signifies manufacturer's trademark. ® signifies manufacturer's registered trademark. © 1983 Alpha Software Corp.
*DIME II directly reads and writes Lotus 1-2-3 Workbooks (TM) files. No translation is required.

CIRCLE 139 ON READER SERVICE CARD

MicroSpooler Saves Time

MicroSpoolers mean an end to waiting. The MicroSpooler stores data and feeds it to your printer as fast as it can handle it. You don't lose valuable computer time waiting for the printer to do its job.

Easy to install. Easy to use. Easy on the budget. These stand-alone MicroSpoolers can be installed in-line between virtually any printer and any computer.

Features:

- 16K memory (user expandable to 32K or 64K) • Status readout
- Internal power supply • Vertical mount configuration • Independently selectable baud rates and handshaking • Satisfaction guaranteed • Priced from \$219.00



Send or call toll free for literature on our complete Spooler lines.

CONSOLINK CORPORATION

Dept. 2-48
1840 Industrial Circle
Longmont, CO 80501
(303) 651-2014
800-525-6705

CIRCLE 132 ON READER SERVICE CARD



PUBLISHER	Jeff Weiner
EDITOR	Jonathan D. Lazarus
EXECUTIVE EDITOR	Carey Sandier
MANAGING EDITOR	Berry Chwen
TECHNICAL EDITOR	Bill Mechrone
STAFF EDITOR	Paul Somerson
SENIOR COPY EDITOR	Anne Freed
ASSISTANT EDITORS	Jennifer de Jong, Susan Hurley, James Langdell, David Obregon
EDITORIAL ASSISTANTS	Karen Cook, Lisa Ellen, Lisa Kleinman
ADMINISTRATIVE ASSISTANT	Iris Knitall
CONTRIBUTING EDITORS	Frank J. DeWitt, Jr., Will Fawcett, Stephen Maros, Peter Norton, Martin Porter, Wina Roach, Jared Taylor, Lindsey Van Gelder
FOUNDING EDITOR	James Edlin
DESIGN DIRECTOR	Brian Densin Day
ART DIRECTOR	Minch Shostak
ASSISTANT ART DIRECTORS	Valerie Myers, Mary Shapiro
PRODUCTION ARTIST	Dulcie Dew
ILLUSTRATORS	Kris Boyd, Brad Holland, Alice Lager, Dennis Makai, Mike Okamoto, Steve Salomon, Edward Smith
PHOTOGRAPHERS	Dennis Buttencourt, Gary Gladstone/Imager Bank, Shig Ikeda
SUBSCRIPTION DIRECTOR	Chet Kilianowski
TELEMARKETING MANAGER	Linda Roseller
NEW BUSINESS MANAGER	Eric A. Bernhard
RENEWAL AND BILLING MANAGER	Shane Boel
DIRECT RETAIL SALES	Lynn Kujawa
ADVERTISING COORDINATOR	Karen Jacobs
DISTRICT MANAGERS (212) 367-7947	
SOUTHERN CALIFORNIA	Barbara Parkas (212) 367-2100
NEW ENGLAND AND NEW YORK	Ellen Atkinson (212) 725-7947
MIDWEST	John Hemsath (212) 346-2600
ACCOUNT SALES MANAGER	Pauline Schaefer
ACCOUNT REPRESENTATIVES	Northwest and New York State Jane Anderson
	Mid-Atlantic and Southeast Arlene Steadman Midwest
	Patty Schwartz New England Wayne Stephen
	Northern California Jan Schultz Southern California
	Bob Otnow New Business Jill Holtzman
ADVERTISING OFFICE	Ziff-Davis Publishing Company, One Park Avenue, New York, NY 10016 (212) 725-7947
FOUNDER	Anthony Gold

CONSUMER COMPUTERS & ELECTRONICS MAGAZINE DIVISION

PRESIDENT	Larry Sporn
VICE PRESIDENT MARKETING	J. Scott Briggs
VICE PRESIDENT CIRCULATION	Cecile J. Bredel
VICE PRESIDENT GENERAL MANAGER	Ellen G. Markowitz
CREATIVE DIRECTOR	Peter J. Blank
EDITORIAL DIRECTOR	Jonathan D. Lazarus
PROMOTION MANAGER	Rozal Sonnenberg

ZIFF-DAVIS PUBLISHING

President Richard P. Frisze; President, Consumer Magazine Division Albert S. Trisna; Executive Vice President, Marketing and Circulation Paul H. Chock; Senior Vice President Phillip T. Hoffman; Senior Vice President Sidney Hertz; Senior Vice President Edward D. Mulfeld; Senior Vice President Philip Sine; Vice President Baird Davis; Vice President George Mennery; Treasurer Selwyn Teubman; Secretary Bertram A. Almans

PC: The Independent Guide to IBM Personal Computers (IBM P/PC-4500) is published monthly for \$20.00 per year, \$47.00 per year, and \$63.00 per year. Additional postage \$8.00 per Canada, \$20.00 other foreign by PC Communications Corp., a subsidiary of Ziff-Davis Publishing Co., One Park Ave., New York, NY 10016. Second-Class postage paid at New York, NY 10016 and at additional mailing offices. POSTMASTER: Send address changes to PC, P.O. Box 2445, Boulder, CO 80521.

Editorial and Business Office: One Park Ave., New York, NY 10016. Editorial (212) 725-4944, Advertising (212) 725-7947. For subscription inquiries and service, write to PC Magazine, P.O. Box 2445, Boulder, CO 80521.

PC is an independent journal, not affiliated in any way with International Business Machines Corporation. IBM is a registered trademark of International Business Machines Corp. Entire contents Copyright © 1983 PC Communications Corp. All rights reserved. In whole or in part without permission is prohibited. The following are trademarks of PC Communications Corp.: PC, PC: The Independent Guide to IBM Personal Computers, PC Guide, PCM, PC Mart, Personal Computer Guide, Home Computer Guide, Computer Guide, The Computer Zone, Database Zone, PC-Lab, PC Communications, PC People, Project PC, PC Tutor, Wish List, PC, ReadMe, User's Line.

Permissions: Material in this publication may not be reproduced in any form without permission. Requests for permission should be directed to Beta Assets, Ziff-Davis Publishing Co., New York, NY 10016.

BPA Membership (Selected Market Audit Division) Applied For February 1983. Printed in the United States of America.

REALWORLD EXPERIENCE

THERE IS NO SUBSTITUTE

RealWorld™ Business Software
For Most Popular Microcomputers



Courtesy: Fred Owen, Village Instruments

Photograph: Joseph Neve

ACCOUNTS RECEIVABLE ☐ ORDER ENTRY ☐ INVENTORY CONTROL
SALES ANALYSIS ☐ ACCOUNTS PAYABLE ☐ GENERAL LEDGER ☐ PAYROLL

Whatever the product or service, it takes experience to produce quality and lasting value.

There are no inexperienced master violin makers. And so it is with software.

The staff at RealWorld Corporation have been creating packaged software products for nearly ten years. During that time, over 40,000 users have kept us in touch with reality.

We don't sell "disposable software". We haven't tried for the fanciest packaging. We won't promise "anyone can master it in ten minutes".

Mature accounting software just isn't like that.

But we will say this:

If your accounting needs are typical, and if you are willing to invest the time to read and follow our clearly written instruction manuals, RealWorld Software can work for you.

Visit your local computer store for more information, or call one of our 800 numbers for the authorized reseller nearest you.

mbsi™ A Division of RealWorld Corporation

DOVER ROAD, CHICHESTER, NH 03263

603/798-5700 TOLL FREE: 800-255-1115

California: 800-441-1777 Western U. S.: 800-321-1777



In This Issue

NETWORKS

Battle Of The Network 92
Stars/Bill Machrone
How well did these seven
local area networks perform?

Getting Hooked On 107
PCnet/Ron Jeffries
A low-cost local network
system.

Getting The Net 123
Working/James Chumbley
How to plan and install an
office PC network.

IBM EYE

IBM's Post-PC Image 131
Winn Rosch
Wall Street has taken a new
look at IBM because of the
PC.

IBM Assembly: The 138
Inside Story/Bill Machrone
Building PCs in Boca Raton.

The Talk Of Boca 162
Martin Porter
IBM programmed the
success of this Florida city.

SCAMP: The Missing 190
Link In The PC's Past/Paul
Friedl

A portable personal
computer was invented 10
years ago—by IBM.

Why The Good Guys 404
Don't Use PCs/Steven Manes
The Whiz Kids' behind-the-
screen dealings with IBM.

WORD PROCESSING

Why We Like 208
WordStar/Paul Somerson
There's life in the old
program yet.

WordStar Training 234
Aids: The Whole Works/
William K. Howard
Books, cassettes, and tutorial
disks for learning word
processing.

WordPerfect Gets 315
Personal/Will Fastie
Personal WordPerfect is a
budget version of a powerful
program.

VisiWord: What You 329
See Is (Almost) What You
Get/Stephen Manes
This program has some
screwy operations.



SOFTWARE

Software Migrations 331
Todd Katz
Programs made for
mainframes are en route to
the PC.

Surviving An Apple 373
To PC Switchover/Gordon
McComb
Several programs help you
convert programs and data.



This Little PC Went To 483
Market/Bruce Nissim
Auto Trader guides you
through the commodity
markets.

Evaluating Educational 519
Software/Dick Walker
A guide to instructional
programs that run on the
IBM PC.

Family Roots Puts A 540
Cursor On Your Precursors/
Eric Freedman
Save your family tree and
history on disk.

Engineering 567
Applications For The PC/
Steven Rogers
PSI's software packages aid
in system analysis.

Report Manager: Not 571
Just Another VisiClone/
Jared Taylor
This three-dimensional
spreadsheet handles a wide
range of data.
Counting Your Coins 599
Eric Freedman
Two numismatic software
packages.



MARKETPLACE

A PC By Any Other 281
Name/Lorraine King
 Are there worthier computers that lack the magic letters I-B-M?

FINANCE

Home Based 301
Banking/Lisa Harbatkin
 PCs can check into HomeBase, Citibank's banking network.

COMMUNICATIONS

Multiple Personalities: 347
Emulation With The PC/ Michael Olfe
 A PC can play the role of a mainframe's remote terminal.

Compuser: Reach Out 424
And Touch Someone/Lindsay Van Gelder

Everything you always wanted to know about mingling via modem.

BOOK EXCERPT

Pascal For The IBM PC/ 443
Ted G. Lewis
 From *Pascal Programming For The IBM Personal Computer*

APPLICATIONS

Just The Facts, RAM/ Vanessa Schnatmeier 472
 The LAPD's vice squad uses a PC dedicated to fighting crime.

The PC Moves Into Real Estate/Bill Alvernaz 491
 How realtors in California use PCs in their work.

Library Automation 509
Reaches Out To The PC/ Victor Rosenberg
 Catalogs and information can be stored in a new way.



HARDWARE

Obedience Training For Your Printer/Winn Rosch 605
 The Printer Optimizer is a buffer with its own control panel and microprocessor.

Printing Through The Pipeline/Winn Rosch 613
 This printer buffer lets you mix text and graphics.
A Plenitude Of Printers, Part II 621

A guide to features and prices of printers for the PC.
There Is A Videodisk In Your PC's Future/Ariel Schwartz 631
 PCs can control this source of superior sounds and images.

READER'S TURN

Mr. Norton, I Beg To Differ/Greg Weissman 553
 The loyal opposition speaks in support of PC-DOS 2.0.

PROGRAMMING

Assigning Strings To Keys With PC-DOS 2.0/Greg Weissman 559
 Step-by-step instructions for customizing the PC's keyboard.

OPERATING SYSTEMS

MS-DOS Boards The S-100 Bus/SSteve Rosenthal 625
 S-100 computers may be faster vehicles for running the PC's software.

PC ARCADE

Under The Big Top/ Corey Sandler 645
 A circus game plays in the center ring.

BOOK REVIEW

The VisiCalc Books/ Bruce Filbeck 649
 Tutorials and models for users of this spreadsheet.

DEPARTMENTS

From The Editor's 39
Screen/ Corey Sandler
Letters To PC/ 56
PC-Communications 73
The Norton Chronicles/ Peter Norton 86
New On The Market 656
PC Tutor/Mark Zachmann 680
PC BlueBook 687
Club News/Susan Hurley 713
PC Mart 728
User-To-User/Bill Machrone 723
PC Product Index 731
Perspective/Will Fastie 737
Index To Advertisers 742
Coming Up 745

COVER

Photography by Shig Ikeda.
 Vertebra chair courtesy of Charrette, New York.



It took hundreds of years to build the world's most advanced spreadsheet.

Way back in 1534, a Venetian scholar wrote a text that standardized the techniques of modern bookkeeping. And up till 1979, there weren't a lot of real improvements in the way people did spreadsheets. You still had to enter all your figures by hand. Run all the totals yourself. And when you had to make a few changes, you had to run the totals all over again.

Then along came a program that let you create spreadsheets on a personal computer. Without touching a pencil. Or adding anything by hand. Best of all, this new program gave you the freedom to look at your balance sheet a dozen different ways if

you felt like it. Because all you had to do was change one figure, and the computer would refigure everything else for you. Automatically.

Like most breakthrough ideas though, this original spreadsheet program had a few things that definitely needed improvement. For instance, all the columns had to be the same width. And the entire system took about 20 hours to learn.

So we developed SuperCalc® which was such a giant step in the

right direction that it became a best-seller. Over 250,000 copies in only 18 months.

Today, we've gone even farther. After talking with thousands of customers, we've found a lot of important new features you'd like to have. And we've built them into the world's most advanced spreadsheet.

SuperCalc®.

1534

1549 Ali abino

154 P Pro et danno // A doni uerij, per
tratto in regio, per saldo di quello

157 P Pro et danno // A spese de
spese fatte, come in effe appar, per
154 g 10 p 14

156 P Fitti della possessione de Meian //
per finto de quello per l'anno profetto
154 g, per saldo de quello // 45 g

157 P Pro et danno // A spese diverse
l'anno profetto, come in effe appar, per
299 g 12 p

158 P Pro et danno // A spese de soler
piu spese fatte l'anno profetto, come
per saldo di quello // 45 g 12 p

159 P Pro de spesa in monte // A Pro de
ha fequida, come in quello appar, per
150 g p

160 P Pro et danno // A Censual de mi

1979

STATEMENT

	JAN 1980	FEB 1980	MAR 1980
SALES			
COST	300	330	
GROSS	700	770	
R & D	160	176	
MARKETING	200	224	
ADMIN.	140	151	
TOTAL	500	551	
INCOME	200	219	
TAXES	00	00	
NET	120	131	

1981

INCOME STATEMENT

NET SALES	3
COST OF GOODS SOLD	3
GROSS PROFIT	7
RESEARCH & DEVELOPMENT	1
MARKETING	2
ADMINISTRATIVE	1
TOTAL OPERATING EXPENSES	5
INCOME BEFORE TAXES	2
INCOME TAXES	
NET INCOME	1

It'll take you 10 minutes to learn it.

10 minutes to SuperCalc²

Create your first spreadsheet model in 10 minutes flat.

With SuperCalc² you get all kinds of features that have never been possible before. Like custom formatting capabilities. Automatic consolidation. Sorting. And more. Take a look at the spreadsheet below, and you'll see just how much we're giving you.

Best of all, we made it just as easy to use as the original SuperCalc. There's a self-paced starter guide that shows you exactly what to do,

step by step. And an AnswerKey[™] that gives you instant help right on the screen. Because of these features, you can actually create your first spreadsheet in 10 minutes flat. Even if you've never used a computer before.

SuperCalc² is available for the IBM PC and XT. Where it can run in full color. With full memory. Even on hard disk. It's also available for CP/M, CP/M-86, MS DOS and other operating systems, so you can use it with most popular personal computers.

But with all its advanced features, SuperCalc² is the same price as the original SuperCalc. Only \$295, suggested retail. We're also offering SuperCalc for only \$195. And an upgrade to SuperCalc² whenever you're ready.

So. If you've always thought there had to be a better way to do your spreadsheets, stop by your closest computer store. And take a good look at SuperCalc². After just 10 minutes, you won't want to do one more spreadsheet the old way.

1983

Combines any number of spreadsheets —automatically!

Calendar/date capabilities.

Percentages.

COMPANY CONSOLIDATED MONTHLY PAYROLL

Today's Date	4/15/83	Deduction Percentages				
Payroll Start Date	4/ 1/83	Fica	6.78%			
Days this period	15	SDI	.8%			
Recalculate YTD Y/N ?	N					
			User-set dec			
Emp#	Employee name	Status	Gross Salary	Total Deduct	Net Pay	YTD Gross
34	Adams	M	\$1,100.00	(\$82.50)	\$1,017.50	\$6,200.00
49	Beckett	S	\$750.00	(\$56.25)	\$693.75	\$3,250.00
84	Johnson	S	\$850.00	(\$63.75)	\$786.25	\$5,950.00
92	Jones	M	\$900.00	(\$67.50)	\$832.50	\$6,300.00
12	Samson	S	\$500.00	(\$42.00)	\$458.00	\$3,920.00
19	Santos	M	\$650.00	(\$48.75)	\$601.25	\$4,550.00
45	Smith	E	\$700.00	(\$52.50)	\$647.50	\$4,900.00

Total # employees 7 Floating \$ signs.

Embedded commas.

Total Gross Salaries (100's) \$55.1
Total Deductions (100's) \$-4.1
Total Net Pay (100's) \$51.0

Negative numbers in ().

Arrange reports numerically or alphabetically, like this

Numbers in 100s or 1000s.

SuperCalc²
SORCIM[®]

2310 Lundy Avenue
San Jose, CA 95131
(408) 942-1727

Chart-Master™ turns volumes of complex data into easy-to-understand graphics.



"A picture is worth a thousand words." With this simple concept as a building block, Chart-Master is changing the way busy executives, analysts and secretaries look at, interpret and present information. In a fraction of the time required to wade through volumes of printouts, you can



Values printed at data points, both left and right Y-axis scales; floating legends & bars; both horizontal & vertical formats; exploded pie sections

produce easy-to-understand bar charts, pie charts and scatter diagrams quickly and dramatically. Chart-Master makes it easy to customize reports and presentations with six different fonts, label placement, proportional pie charts and more.

Menu-driven Chart-Master allows you to enter data and select a chart format at the press of a button. You then preview your selection on your personal computer screen as it would appear in final form. Or, you can review the various Chart-Master graphic options to make sure you have selected the most effective format. When satisfied,

you can transfer your selection to paper or acetate transparencies for a colorful, presentation-quality chart in seconds.

Chart-Master presents a *clear picture* of the "bottom line," which conveyors of information understand and decision makers appreciate. That's why major corporations like GE, Eastman Kodak, Exxon, Union Carbide, GM, AT&T, DuPont, 3M, Citibank, Motorola, Procter & Gamble, and GTE rely on Chart-Master to translate "volumes of complex data into meaningful information."

Chart-Master supports the IBM Instruments XY750, Panasonic VP Series, Houston Instruments DMP29, Yokogawa PL1000 and Strobe plotters, in addition to the Hewlett-Packard family of plotters, for use with IBM PC and other compatible computers.

The retail price of Chart-Master is \$375. For a complete information kit and name of your nearest dealer, contact Decision Resources, Inc., 25 Sylvan Road S., Westport, CT 06880. (203) 222-1974.

DecisionResources
Software Designed for Decision Makers

CIRCLE 221 ON READER SERVICE CARD

No one else is using this simple method to teach you Lotus 1-2-3.

You didn't learn to swim by reading about it. You took the plunge. With a little extra support at first, 'til you could stay afloat on your own.



ATI's training software teaches you Lotus 1-2-3 in the same way.

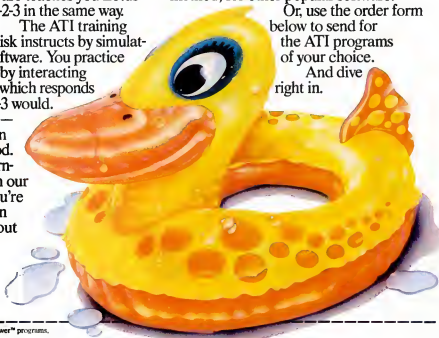
The ATI training disk instructs by simulating the actual software. You practice each command by interacting with the screen, which responds just as Lotus 1-2-3 would.

It's faster—and easier—than any other method. Once you've learned the skills with our helping hand you're ready to swim on your own. Without sinking.

The ATI Training Power package for Lotus 1-2-3, with disk and handbook, is available at your computer dealer. Along with our line of training programs, based on the same simulation method, for other popular software.

Or, use the order form below to send for the ATI programs of your choice.

And dive right in.



Please rush me ATI Training Power® programs, at \$75 each for this software:

Integrated Software

☐ Lotus 1-2-3

Database Management

☐ dBASE II-vol. 1 & 2
☐ EasyFiler

Word Processing

☐ WordStar-vol. 1 & 2
☐ EasyWriter II
☐ Perfect Writer
☐ Spellfinder
☐ Benchmark

Financial Planning

☐ Multiplan
☐ SuperCalc
☐ VisiCalc
(\$50 Limited Offer)
☐ Perfect Calc
☐ EasyPlanner
☐ Microplan

Operating Systems

☐ PC DOS
☐ MS DOS
☐ CP/M

Programming

☐ BASIC
☐ APPLESOFT BASIC

Accounting

☐ BPI Gen. Acct.
☐ Peachtree General Ledger*
☐ Peachtree Accounts Receivable*
☐ Peachtree Accounts Payable*

*PC(MS) DOS formats only

ATI Money Back Guarantee

If you're not completely satisfied with how fast you learn with ATI Interactive Training Power Programs, simply return within 3 days for full purchase refund.

Enclosed is \$75 each plus \$2.50 shipping. Visa/Calc Training \$50. (CA add 6.5%)

Name _____ Phone (____) _____

Street _____

City _____ State _____ Zip _____

My computer uses:

☐ PC DOS ☐ XENIX
☐ MS DOS ☐ APPLE II CP/M
☐ CP/M ☐ APPLE IIe 80 col.
☐ CP/M-86

My computer brand is _____

Dealers:
call for sales kit
(213) 546-4725

For rush order call:
(213) 546-5579



Mail order form to:
Software Training Company
A Division of ATI
3770 Highland Avenue, Suite 201C
Manhattan Beach, CA 90266

ATI Training Power™

The following names are trademarks of the following companies: ATI Training Power: of American Training International; CP/M, of Digital Research; PC DOS, of IBM; WordStar: of Micropro; Benchmark, of Metasoft; EasyWriter, EasyFiler, and EasyPlanner: of Information Unlimited Software; MS-DOS, and Multiplex, of Microsoft; dBASE II, of Ashton-Tate; SuperCalc, of Sorcim; VisiCalc, of VisiCorp.; Microplan, of Chang Laboratories; Peach Calc, of Peachtree Software; ATI Training Power, Software Samples: of American Training International; Spellfinder, of Lernout; Perfect Writer, and Perfect Calc, of Perfect Software: Lotus, of Lotus.

CIRCLE 116 ON READER SERVICE CARD

"I GOT WHAT I WANTED"



Who can blame him? With PC Tutor, he can get rid of all the confusing instruction manuals and learn about MS-DOS easily. Including an introduction to DOS, all about diskettes, disks, directories and files, DOS commands for directories and files, and DOS commands that control the system. Also how to use special keys and all about the line editor EDLIN and the BATCH utility.

PC Tutor makes learning easier, faster, cheaper.

Requires 64KB, 1 double-sided diskette drive, an 80-character display and MS-DOS.

Suggested retail \$59.95. See your PC dealer. Dealer inquiries welcome.



**Comprehensive
Software
Support**

2316 Artesia Blvd., Suite B
Redondo Beach, Ca. 90278
213/318-2581

No other financial software even comes close.

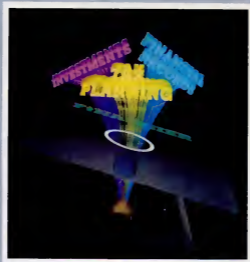
Now Financier II

The financial software that has met with resounding approval from professional software reviewers just got even better. Now, the Financier Personal Series has been upgraded to Financier II. Combined with Financier's Tax Series and Investor's Series, it creates a totally integrated financial management system. Financier II is so easy to use that it is ideal for personal finance yet powerful enough, to function as a small business system.

"It is clear that the Financier Personal Series is the most sophisticated and flexible of the financial programs under review here."

Burton Alpers, Ph.D.
Reviewer, SOFTALK
June, 1983

Financier II features enhanced graphics capabilities, and expansion of Financier's unique auto-checking capability which prints checks directly from a user-maintained database, while updating bank, budget and tax records. Additionally, it provides a full range of professional-caliber financial statements including net worth, and cash flow reports. You can even opt for double-entry accounting methods, if desired.



Introducing Financier II

Now you can have
a completely integrated financial
software system.

"One of the most powerful financial software packages I have ever used. The Financier Personal Series provides an extensive capability to track and manage your financial affairs. The program is easy to use and provides a wide range of financial statements and reports. The program is also very flexible and can be customized to meet your needs."

Steven Yoder and
Sherry Knight, CPA
PC Magazine, February, 1983

Financier II is remarkably easy to use.

You don't have to be a computer whiz-kid to use Financier II. That's because it's menu-

driven. When you need to enter data, just fill in the blanks on the preformatted screen. If you can use an automatic teller machine, you're well on your way to mastering this unique financial software.

Another thing that puts Financier II so far in front of any other financial software package is that it offers powerful tax and inventory functions. In fact, Financier II allows you to maintain literally thousands of these accounts, if you desire. And, each account is separately manageable.

Thus far, no other software company has matched Financier's interlocking combination of a powerful tax-planning package (Tax Series) and a year-round record-keeping program (Personal Series).

Augustin Hedberg
Money, June, 1983

Financier Tax and Investor's Packages.

Financier's Tax and Investor's Series provide the perfect adjunct to Financier II.

Financier's Tax Series lets you create multiple tax cases, and store them for later adjustment. You can even perform "what-if" spreadsheet calculations, generate graphics and print charts.

Financier's Investor Series is a comprehensive portfolio management system that lets you maintain a data base on each security account, each security position, and each security transaction.

Financier Offers

Something for Everyone.

Individuals, businessmen, tax preparation specialists, investors or anyone who wants real financial control cannot afford to miss out on Financier's powerful software packages.

Get the most from your personal computer with the financial software that does the most. Financier II, and Financier's Tax and Investor's Series.

FINANCIER

WE'LL KEEP YOU ONE STEP AHEAD

Financier, Inc., 2000 West Park Drive, Box 570, Westboro, MA 01581 (617) 366-0950

*Apparant Home Finance™, Perlin™, PC/FPF™, Home Accountant Plus™, Financier Personal Series™

**Bonus Accounting System™, Financier Personal Series™, FMS II™, Home Accountant Plus™, Money Maestro™
Financier software is available for IBM® PC, IBM® XT, Digital Rainbow™ and Wang® PC

CIRCLE 241 ON READER SERVICE CARD

SPINNAKER'S LINE OF EARLY LEARNING GAMES IS GROWING AS FAST AS YOUR CHILD'S MIND.

Watching your kids grow up is a lot of fun. But making sure their minds grow as fast as their bodies is even more rewarding. That's where we can help. With a growing line of Early Learning Programs that are not only lots of fun to play, but also educational.

Some of the games you see on these two pages help exercise your child's creativity. Others help improve vocabulary and spelling skills. While others

improve your child's writing and reading abilities. And all of them help your child understand how to use the computer.

So if you're looking for computer programs that do more than just "babysit" for your kids, read on. You'll find that our Early Learning Programs are not only compatible with Apple® Atari® IBM® and Commodore 64™ computers, but also with kids who like to have fun.



FRACTION FEVER™ brings fractions into play. Ages 7 to Adult.



FRACTION FEVER is a fast-paced arcade game that challenges a child's understanding of fractions. As kids race across the screen in search of the assigned fraction, they're actually developing a basic understanding of what a fraction is and of relationships between fractions. They're even discovering that the same fraction may be written in a number of different ways.

All in all, FRACTION FEVER encourages kids to learn as much as they can about fractions - just for the fun of it!



The story of STORY MACHINE:™ Ages 5 to 9.

STORY MACHINE is like a storybook come to life. Using the keyboard, your children write their own fun little stories. The computer then takes what they've written and animates their story on the screen, com-



plete with full color graphics and sound. STORY MACHINE helps your children learn to write correctly, become familiar with the keyboard, and lets them have fun exercising their creativity at the same time.

KINDERCOMP:™ Numbers, shapes, letters, words and drawings make fun. Ages 3 to 8.

KINDERCOMP is a game that allows very young children to start learning on the computer. It's a collection of learning exercises that ask your children to match shapes and letters, write their names, draw pictures, or fill in missing numbers. And KINDERCOMP will delight kids with color-



ful rewards, as the screen comes to life when correct answers are given.

As a parent, you can enjoy the fact that

your children are having fun while improving their reading readiness and counting skills.



FACEMAKER™ makes faces fun. Ages 4 to 12.

FACEMAKER lets children create their own funny faces on the screen. Once a face is completed, your children will giggle with delight as they make it do all kinds

of neat things: wink, smile, wiggle its ears, or whatever their imagination desires.



Plus, FACEMAKER helps children become comfortable with computer fundamentals such as: menus, cursors, the return key, the space bar, simple programs, and graphics. FACEMAKER

won't make parents frown because their children will have fun making friends with the computer.





Incredible Trainers!

No matter what level IBM Personal Computer training you want, our interactive tutorial software gives you the answers. Easier, faster, smarter.

Take **The INSTRUCTOR**, for first-time users. PC Magazine called it, "The best . . . introduction to the PC around." It's #1 because it takes the work out of learning initial PC operations.

Professor DOS will challenge you, amuse you, and amaze you.

Both programs use vivid graphic images, creative animation, sound and living color to take you from mystery to mastery of your IBM PC. Each is totally self-paced. And they're "people-literate." So you really do learn.

The most sought-after computer-

assisted training anywhere. Available at IBM PC dealers and software retailers everywhere, separately or in a tutorial set. Affordable at a suggested list price of **ONLY . . .**

\$44.95 — The INSTRUCTOR

\$59.95 — Professor DOS

or

\$94.95 — Tutorial Set



Choosing the right tax shelter is more than a game of chance.

Choosing good investments will always be something of an art. But it shouldn't be a game of chance.

INTRODUCING THE STRATEGISTS. XQ Software introduces two new software programs that take some of the gamble out of your investment decisions, the **Investment Strategist** and the **Tax Strategist**. Designed for investors and investment advisors, they turn your IBM Personal Computer into a sophisticated tool for analyzing the tax and investment aspects of tax sheltered investments.

MAKING INFORMED INVESTMENT DECISIONS...THAT'S THE STRATEGY. These innovative programs tackle three tough questions:

How much tax shelter do you really need?
The **TAX STRATEGIST** tells you how much shelter is right for your financial situation. It helps you plan strategies for reducing your tax liability.

Is this tax shelter a good investment? The **INVESTMENT STRATEGIST** helps you determine which tax shelters are good investments. You can compare tax shelters with each other and with other types of investments.

Does the tax shelter match your tax profile? The **INVESTMENT STRATEGIST** and the **TAX STRATEGIST** work together to help you find the shelters that match your personal needs. Now you can zero in on the best tax and investment approach.

THE COMPANY BEHIND THE SOFTWARE. XQ Software is an Intelligent Systems company. For over a decade Intelligent Systems has been an innovator in personal computer enhancements and color graphic peripherals.

The **Tax Strategist** and the **Investment Strategist** are available through authorized IBM Personal Computer dealers nationwide. Visit one and ask for a demonstration. It will be one of the best investments you'll ever make.



**THE INVESTMENT
STRATEGIST™
\$395**

**THE TAX STRATEGIST™
\$395**

(SOLD INDIVIDUALLY)

XQ™
SOFTWARE
An Intelligent Systems Company

4357 PARK DRIVE/NORCROSS, GA 30093
(404) 923-2880

FOR MORE INFORMATION MAIL THIS COUPON:

PLEASE SEND ME MORE INFORMATION:

- ☐ I'm an investor. PC 11/83
☐ I'm an investment advisor.
☐ I'm a computer dealer.

NAME _____
TITLE/POSITION _____
COMPANY _____
ADDRESS _____
CITY _____
STATE _____ ZIP _____
PHONE () _____
MAIL TO: XQ SOFTWARE, 4357 PARK DRIVE/NORCROSS, GA 30093

Hello, information.

Or, how the IBM Personal Computer can bring you the world.



Modem shown not supplied by IBM

There's a world of information just waiting for you. But to use it, study it, enjoy it and profit from it, you first have to get at it.

Yet the facts can literally be right at your fingertips—with your own telephone, a modem and the IBM Personal Computer.

Plug into the network.

The modem that plugs into your phone takes the codes your IBM Personal Computer understands and turns them into signals that can be transmitted over the phone lines.

On the other end of the phone lines are independent information services* ready for you to access from your home, school, lab or office. So, in minutes, you can tap the resources of over a thousand data bases—and plug into a world of possibilities.

Something for everyone.

At home, for example, you can shop through an electronic catalog. Access mortgage amortization and tax depreciation schedules. Study the wines of France, the foods of Italy. Find property to sell, rent, swap or share. And play hundreds of games.

At school, you can bring news into the classroom—as it happens. You can teach and learn with facts about everything from

phrase origins to plane geometry. You can also tap instructional courses and learn how to program the very IBM Personal Computer you're using.

In the lab, you can call up a wealth of mathematical and statistical programs or retrieve scientific and technological data.

In the office, you can plug into the commodities market. Read abstracts of leading publications. Even get census figures to see who's in your major market. And when you're planning a business trip, your IBM Personal Computer can provide airline schedules and car rental information, as well as tell you what the weather is and where the best restaurants are.

Calling all computers.

And these outside data bases aren't your only information link, either.

With assigned passwords, you can also have access to data that's stored in your company's IBM minicomputer or mainframe via your IBM Personal Computer.

You can even exchange a sales forecast with a manager two floors down or two thousand miles away—one IBM Personal Computer to another.

So the IBM Personal Computer really *can* let you call the world. But there's one call to make first. For more information on where to buy the IBM Personal Computer, call 800-447-4700. In Alaska or Hawaii, 800-447-0890.

IBM

The IBM Personal Computer

A tool for modern times

*Information services are available by subscription at additional cost, and are not supplied by IBM.

CAMEO

HARD DISK SYSTEMS ARE THE SOLUTION TO:

- **Reliable Back-Up Requirements**
- **Large Data Storage Needs**



CAMEO large capacity high performance hard disk systems are the ideal mass storage system for use in those business environments where a company's data bank itself is understood to be one of the most valuable parts of the whole micro-computerized office system. The data bank was costly to acquire and could be more costly to replace. Regular access to it is needed every day without fail.

CAMEO'S subsystem 1050, consists of 40 formatted megabytes of on-line winchester data storage and 10 formatted megabytes of removable winchester cartridge back-up capability. In the unlikely event of a problem with the fixed winchester drive the removable cartridge drive can perform as a fully operable full function high performance on line random access winchester hard disk system. It provides highly reliable (full CRC error checking on full spec winchester media) permanent off-line data storage capability for permanent data archiving.

CAMEO'S configuration options allow multiple computers to access all areas of the disk as well as virtual RAM disk configuration from add-on memory boards. Higher capacity systems and nationwide third party maintenance are available. Immediate availability through CAMEO'S regional distributor network.

IBM
ZENITH
COMPAQ

VICTOR
NEC
EAGLE

A CAMEO interface is available for the above as well as almost any brand of high performance micro computer you are considering for your office use.

CIRCLE 149 ON READER SERVICE CARD

Contact your local CAMEO dealer or:

- **CAMEO ELECTRONICS, INC.**
1626 Clementine
Anaheim, Ca. 92802
(714) 535-1682

- **CAMEO EUROPE**
Postfach 227
8120 Weilheim
West Germany
TEL 08802-691
TLX 59903 CAMEO D

The Trade Marks and Logos of the computer companies referred to above are owned by them respectively and are not the property of CAMEO ELECTRONICS, INC.

In the Hard Disk Jungle Tallgrass Clears a Path



In today's hard disk jungle, Tallgrass clears a path by offering high performance, integrated mass storage solutions for the IBM® PC and compatibles, the T.I. Professional and the Victor 9000 computers.

TALLGRASS INNOVATIVE FEATURES

MASS STORAGE SYSTEMS with formatted HardFile™ capacities of 6, 12, 20, 35 and 70 Mb, all with built-in tape backup.

CONVENIENT INTEGRAL TAPE BACKUP SYSTEM allows rapid tape "image," streaming, or incremental file-by-file backup and restore on ANSI standard inexpensive data cartridges, instead of the usual floppies, video cassettes, or low-capacity removable Winchester devices.

NETWORK READY and fully compatible with networks such as PCnet® and Ethershare!™

HIGH RELIABILITY with dual directory and read-after-write verify options. A dedicated landing zone, where the read/write heads reside when the disk is idle, provides data protection during powerdowns and transportation.

Ethershare!™ is a registered trademark of Microm Corp.

PCnet® is a trademark of Intel Technology.

IBM® is a registered trademark of International Business Machines Corp.

Follow the Tallgrass path to your local computer dealer and watch your personal computer transform into a powerful data processing system. From \$2,995.00 U.S., including integral tape backup.

Available from **COMPUTERLAND® Entré®** Computer Centers, MicroAge® Computer Stores and other participating computer dealers.

New! IBM-XT Cartridge Tape Backup

World Headquarters: Tallgrass Technologies Corp., 11667 W. 40th St., Overland Park, KS 66214 / 913-492-6003 / Telex: 215400-TBYT UR

Canadian Distributors: Micro Ware / 440 Phillip St., Waterloo, Ontario N2L 5H9 / 519-884-4941
ComputerServe / 1675-W, 8th St. / Vancouver, B.C. V6L 1V2, 604-233-7733

European Distributor: CTS Computer Group, LTD
Birmingham, England B276BH / (021) 7073666

Australian Headquarters: Tallgrass Technologies (Australia) / Five Dock Plaza,
Suite 13 / 50 Great North Road / Five Dock / Sydney, N.S.W. 2046 / (02) 712-2010

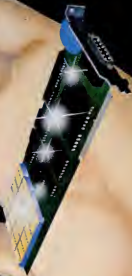


**Tallgrass
Technologies
Corporation**

CIRCLE 645 ON READER SERVICE CARD

The Complicated Way **or** The Easiboard Way

Two Serial Boards
Parallel Board
Chronograph Board
Memory Board
Buffer/Spooler Board
Second Disk Controller Board
Three Disk Drives
Switch Box
Communications Software
Sort Software
More Software
Several Days
Many Hours of Dealer Support



EASITECH
CORPORATION

Exclusively at IBM PC Dealers

2215 Perimeter Park, Suite 22, Atlanta, Ga. 30341 (404) 452-7576

Master European Distributor:

Ferrari Software Limited, London

Telephone: 01-751-5791 Telex: 8953736 Complex G

CIRCLE 230 ON READER SERVICE CARD

IBM is a registered trademark of International Business Machines Corporation.

Copyright ©1993 Eastech Corporation



What's new in IBM PC multifunction expansion boards?

Indigo has put together the most versatile expansion product available for the new IBM PC and IBM PC / XT

the PC MultiPak™

- **4 most requested hardware functions**
The PC MultiPak™ includes a serial communications port, a real time clock/calendar with a 10 year lithium battery, 0 to 256K memory and optional parallel printer port. The PC MultiPak™ without the parallel printer port is ideal for users with the IBM monochrome/parallel printer adapter installed.
- **Zero memory option**
The PC MultiPak™ is available with no memory installed so you can fill your I/O needs today and still have memory expansion capability to an additional 256K for your future needs. This makes the PC MultiPak™ the perfect mate for the new IBM PC and IBM PC / XT.
- **4 software packages**
The PC MultiPak™ includes our four most popular software packages. **Drive-It™** converts 32K to 320K of extra memory into an ultra-fast drive. **Spool-It™** utilizes up to 64K of extra memory as a printer buffer and eliminates valuable time spent waiting on the printer. **Print-It™** prints any IBM text or graphics screen to Epson printers. **Color-It™** prints screens to IDS printers. Color images can be printed on IDS prism printers. These software programs have received critical acclaim in Infoworld, Softalk, PC Age and Creative Computing magazines. Thousands have been sold separately. This \$200 retail value is included in the PC MultiPak™ at no additional charge. DOS 2.0 Compatible.
- **5 year warranty**



\$297

* ALL SOFTWARE INCLUDED
* NO INSTALLED MEMORY

64K-\$365, 128K-\$432, 192K-\$499, 256K-\$565

PARALLEL PORT OPTION ADD \$30

64K MEMORY EXPANSION KIT \$87

SOFTWARE AVAILABLE SEPARATELY

DRIVE-IT \$59.95, SPOOL-IT \$44.95

PRINT-IT \$44.95, COLOR-IT \$49.95

indigo
data systems, inc

100 E. NASA Rd. 1, Suite 106, Webster, Texas 77598



Indigo products may be found at ComputerLand and other fine stores.
Dealer And Customer Inquiries call TOLL FREE 1-800-231-6480
In Texas Call Collect (713) 486-6186
CIRCLE 274 ON READER SERVICE CARD

"BUSTED"

'SPIDER' KIRKS
C-837542

CALIF 1983

3-28-60

007 GF



He wouldn't be in this mess if he'd known about DB TUTOR. He wouldn't have taken so long looking at complicated, and expensive, database packages. He'd have known that DB TUTOR teaches you all about databases, like DBASE II, 1-2-3, and more. Or that DB TUTOR assists in determining your individual database needs, then provides a database system, PC BASE, as an added bonus.

Before you spend more than \$500 for something that does not apply to you,

find out about DB TUTOR.
Suggested retail \$95.00. At your PC dealer

DBASE II is a copyright of Ashton-Tate Inc.
1-2-3 is a copyright of Lotus Inc.



Comprehensive Software Support

2316 Artesia Bl., Suite B
Redondo Beach, CA 90278 213/318-2561

CIRCLE 767 ON READER SERVICE CARD

ANNOUNCING THE END OF WORD PROCESSOR CONFUSION

It's one confusing business, choosing a word processor. All those companies assuring you theirs is the most fantastic one of all. And leaving you to cut through all the smoke and hopefully whittle them down to the best one for you.

Well, we can help. If you'll just invest the next three minutes reading this, we'll tell you about a word processor that makes picking the right one a real breeze.

FIRST, A WARNING. There are two things you must do when evaluating any word processor. First, be careful. It's no secret that many of today's claims about being easy to learn and use just don't stand up to careful comparison. Watch carefully for complicated codes and programs that require "training sessions." Secondly, be selective. Buy a word processor you can use on a daily basis, not one that requires another "training session" when someone goes on vacation. In other words, be very careful to select



the word processor that's absolutely the best and easiest to use. Which is what we'll now introduce you to.

WHY ONE WORD PROCESSOR MAKES THE MOST SENSE OF THEM ALL. Meet WordPlus-PC. It's the advanced, "user-oriented" software package that turns your IBM-PC computer into a word processor equipped with the sophisticated capabilities of far larger, more expensive systems.

THE REMARKABLE WORDPLUS-PC STORY. In a nutshell, it's this. WordPlus-PC was designed from the ground up to be the very latest in word processing technology. It has all the important features you

could ask for. And the program is so easy to learn and use it defies comparison with other software.

HOW WE CAN BE SO SURE OF OURSELVES. We're Professional Software, a leader in word processing software with over 30,000 customers contentedly churning out letters and documents around the world on personal and business computer systems. We know precisely what a top quality word processor must do. And we've studied all the shortcomings of our competitors. That's how WordPlus-PC came to be the easiest-to-use word processor ever.

ALL THE FEATURES YOU'D EXPECT.

WordPlus-PC is both powerful and versatile. Its long list of major functions includes movement of paragraphs, global search-and-replace, and creation of multiple "boilerplate" and personal letters with the touch of a few buttons. There are 3-line headers and footers and automatic page numbering. When you underline or boldface words as you type, WordPlus-PC displays them in that form on the screen. You can merge information created by popular spread sheet programs. You'll create personal letters quickly and easily, or merge name and address information from other programs. You can easily create standard layouts for preprinted forms and use WordPlus-PC to prepare



answers to questions. That's how WordPlus-PC helps you learn. In addition to the help you'll get from your dealer, we're ready to assist you when you call our special toll-free number and talk to one of our carefully trained advisors. This service is available at no charge during the 90 days following receipt of your user registration card. It's all part of Professional Software's total commitment to customer service and support.

A BREEZE TO LEARN AND USE.

With WordPlus-PC's easy-to-use documentation, you'll be using your word processor right from the first minute. After an hour, you'll feel at home with all the basic functions and ready to explore the more sophisticated ones. After a few hours you'll put the manual away. There are

SEE WORDPLUS-PC FOR YOURSELF AT YOUR COMPUTER DEALER. Call us today. We'll answer all your questions. And we'll give you the name of the Professional Software dealership nearest you. Then go witness WordPlus-PC in action. Because once



invoices or quotations. For large corporate customers, WordPlus-PC has the capability to merge information from files created by the firm's mini or mainframe computer. You can even type new documents while the system is printing other ones. And you'll find WordPlus fully compatible with virtually all popular ASCII letter-quality and dot matrix printers.

never any complicated or confusing codes to memorize or look up. Rather, the screen's "message area" reminds you how to do what you want. WordPlus-PC's unique keyboard color coding makes things even easier. And whenever there's a question, simply press the HELP function to get back on track.

ALL THE HELP YOU NEED VIA TOLL-FREE PHONE. Learning something new goes best when you have encouragement, reassurance and

you're sitting in front of WordPlus-PC you'll quickly see where all our confidence and enthusiasm come from. After all, you already own the best personal computer. The best word processor is only \$395. So call us today.

**CALL US TOLL FREE:
1-800-343-4074**

Professional Software Inc.

51 Fremont Street, Needham, MA 02194 Telephone (617) 444-5224

Dealer, distributor, OEM manufacturer, and corporate inquiries are invited. Call us at (617) 444-5224

WordPlus-PC is a trademark of Professional Software Inc.
Specifications are subject to change without notice.
WordPlus-PC was designed and written by Andres Escallon.

CIRCLE 374 ON READER SERVICE CARD

Software reproduction. Endless, perfect, accurately-repetitive software reproduction.

Concentrating our creative energies in that direction, Logic General has become synonymous with software duplication for software authors, publishers and distributors; equipment manufacturers; and companies in both the public and private sectors.

Combining years of experience as a leading distributor and

duplicator of magnetic media with the latest automated high-speed production equipment, Logic General can satisfy software duplication orders of literally any size and complexity.

We can tailor your order to cost, performance and system parameters with precision and flexibility. Most importantly, the accuracy, reliability and quality of each Logic General-duplicated diskette

is guaranteed, 100%.

High capacity. Prompt service. 100% verified duplication. All at a most competitive cost. For complete information, call Logic General. Where all software is re-created equal.



LOGIC GENERAL CORPORATION
31999 Aurora Road
Cleveland, OH 44139

**THE ONLY THING ON OUR MINDS
IS REPRODUCTION.**

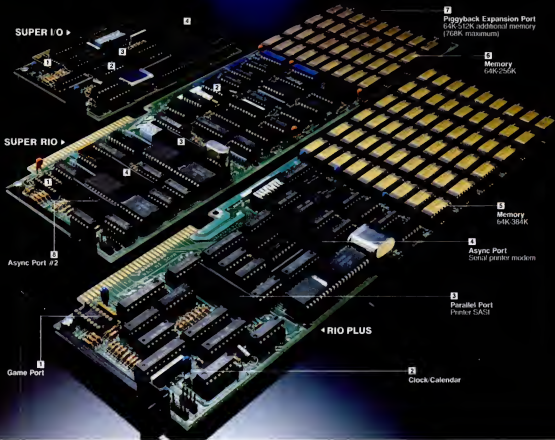


Call toll-free: (800) 321-8908. In Ohio, (216) 349-2800.

CIRCLE 297 ON READER SERVICE CARD

© 1989 LOGIC GENERAL CORPORATION

Continued on page 10



What you get out of your IBM PC/XT depends on what you put into it.

The versatile multi-function boards from STB offer more functions and more memory.

If your personal computing applications have outgrown your personal computer's hardware, there's a smart way of expanding your system while still leaving plenty of room to grow.

The secret is the line of multi-function boards from STB.

Our SUPER RIO™ combines two asynchronous RS-232-C serial communication ports for interfacing modems, serial printers, plotters, mice, and an almost limitless list of other peripherals, a parallel I/O port for interfacing printers and hard disk controllers, a battery operated clock/calendar that remembers the date and time even when your system is turned off, a game paddle port that can use either APPLE™ or IBM™ compatible joysticks, and up to 256K of additional memory.

The STB Piggyback™ board adds up to 512K more memory onto the SUPER RIO for a total of 768K. And the pair uses only one expansion slot.

Included free with the SUPER RIO board is the PC Accelerator™, which combines printer buffering and high speed disk emulation into one easy to use program.

Our RIO PLUS™ board includes all of the I/O functions of the SUPER RIO (less one serial port) with on board memory expansion capability of up to 384K. When used with a 256K computer, this board gives your system a full 640K of memory. Of course, PC Accelerator is also included with every RIO PLUS.

If you already have enough memory, the STB SUPER I/O™ board adds a parallel I/O port, serial port, game port, clock/calendar and PC Accelerator to your system. And, it's small enough to fit in a short slot on the XT.

As new functions and applications arise, you can count on STB Systems to provide convenient, affordable ways to adapt these innovations to your system.

Compare our quality products at your local dealer, or for more information please write or call us.

Expanding Microcomputing

STB
STB Systems, Incorporated™

601 North Glenville, Suite 125
Richardson, Texas 75081(214) 234-8750

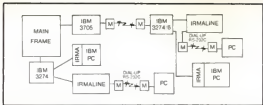
All STB multi-function boards include a serial and parallel cable.
Apple is a registered trademark of Apple Computers, Inc.
IBM is a registered trademark of International Business Machines Corporation.
PC Accelerator is a registered trademark of NewCorp.

©1983 STB Systems, Inc.

CIRCLE 430 ON READER SERVICE CARD

Here are two beautiful ways to get small computers on line with the mainframe quickly, easily and economically—yours from TAC, home of the industry's first coaxial cable links between small computers and IBM 3270 networks.

IRMA™ is the Decision Support Interface™ that gets IBM Personal Computers and IBM PC XT's into the 3270 mainstream via direct attachment to 3274 or 3276 controllers.



IRMA and IRMALINE. The TAC family connections that help small computers think big.



IRMALINE™ does the same for remote IBM PCs, IBM PC XT's, Apple Lisas and DEC Rainbows, among others, with just a local phone call to a nearby 3270 controller.

Both can go to work literally minutes out of the box. Both provide mainframe data access, selection and storage, and data communication back to the mainframe.

Put first things first. Find out more about the TAC first family of 3270 micro/mainframe connections. For information, write TAC, 120 W. Wieuca Rd., N.E., Atlanta, Georgia 30042. Phone: (404) 252-1045, TELEX 54-9600. Or call us toll-free (800) 241-IRMA. **Getting computers down to business.**



CIRCLE 664 ON READER SERVICE CARD

IBM PC and IBM PC XT are trademarks of International Business Machines Corporation. Apple and Lisa are trademarks of Apple Computer, Inc. Rainbow is a trademark of Digital Equipment Corporation.



Introducing the PLATO Microlink Network



Now...network your IBM PC to world-famous PLATO[®] educational courseware—and more. All for just \$5 an hour.



For this special low price, IBM PC users can get interactive education, authoring, electronic mail, graphics and games on the PLATO Microlink[™] network. This network service of Control Data brings a world of capability right into your home in a specially-reserved time-frame, 6 p.m. to 3 a.m., every day. (7 a.m. to 3 a.m. on weekends and holidays.)*

PLATO BRINGS NEW EXCITEMENT TO LEARNING.

Act now to get outstanding PLATO educational courseware home-delivered, for you and your family, on your IBM PC. Choose from more than 150 titles from business simulation to medicine, mathematics and social sciences—even language and reading lessons.

THE GRAPHICS TO GROW WITH.

With the PLATO Microlink network you get one of the most comprehensive graphics systems around. The sophisticated graphics editor lets you draw lines, boxes, circles, arcs, vectors. Generate advanced graphics, display, print, store them away and use them over and over again. Most lessons and games use these graphics to give you spectacular displays.

UNIQUE INTERACTIVE GAMES.

Thirty advanced, interactive games so far, all delivered on your IBM PC via the PLATO Microlink network. You get "Roll 'em", "Maze War", "Chess", "Concentration" and dozens of others. You get "Moria", one of the most exciting adventure games a computer network ever delivered. And you get "Empire"—a galaxy-wide game played against other people on the PLATO Microlink network. A game so popular, so interactive, that PLATO networkers are playing it right now, while you're reading this ad.

THE INCREDIBLE ELECTRONIC MAIL.

Bulletin boards are common, but PLATO gives you something a little bit special—and easy to use. It keeps a string of responses for each original note. You can choose to look only at unread notes and responses.

SIGN UP NOW—PARTICIPATION IS LIMITED.**

Send in the order card by November 30, 1983. You'll get the Microlink disk and user guides—with a regular price of \$50—for the limited-time price of just \$15. Then network time costs you only \$5 an hour. (There is only a \$10 annual registration fee and no monthly minimum.)

So if you have an IBM PC with 64K RAM, disk drive, 300 or 1200 baud modem, an asynchronous communications adapter and a color/graphics monitor adapter, you're just about there. You also need a monitor that will operate with your color/graphics board.

Be the first to send in the order card. You'll get what you need to link up—disk, complete instructions and your private code name and password.

Send in the order card today. Or get additional information by calling toll-free 800/233-3784; in California call 800/233-3785; or write Control Data Publishing Co., P.O. Box 261127, San Diego, CA 92126.

Special message to THE SOURCE[™] subscribers.
See the new past category, PLATO,
for a special offer.

THE SOURCE[™] is a servicemark of Source Telecomputing Corporation, a subsidiary of The Reader's Digest Association, Inc. THE SOURCE services are offered in participation with Control Data Corporation.

*Closing time may differ regionally. **Participation is limited by the capacity of the network.

Control Data Publishing Company, 4455 Eastgate Mall, San Diego, CA 92121.

PLATO

Computer-Based Education

CD
CONTROL
DATA
PUBLISHING

CIRCLE 273 ON READER SERVICE CARD



Some people
have dreams
while others
have visions.

THE WORD PROCESSOR YOU'VE BEEN DREAMING OF

At SoftWord, we had a vision of what word processing on a personal computer ought to be.

We were challenged by a blue chip insurance company to create word processing for the IBM® PC that would mimic the features and functions of a dedicated system. Other software manufacturers thought we were dreaming.

We envisioned a word processing system that would make full use of the PC and its keyboard. With MultiMate®, you get over 80 powerful word

processing functions. Merge, a library for boilerplate, automatic underlining on the screen, on-line help, everything dedicated word processing could give you and more.

In our wildest dreams, we never imagined we would write the documentation reviewers say is the best in the industry. Or offer free enhancements for 180 days, including a spell checker/corrector with an 89,000 word dictionary.

Or that we would be called the "industry heavyweight."

By adding quality technical support, toll-free to end users, we took the nightmare out of word processing. In case you think it's still a dream, try MultiMate at a computer store near you.



CIRCLE 477 ON READER SERVICE CARD

SOFTWARE SYSTEMS, INC. (203) 522-2116 52 Oakland Avenue, North, East Hartford, CT 06108

MultiMate is a trademark of SoftWord Systems, Inc. IBM is a registered trademark of International Business Machines Corp.

Only the PC Saver™ Line Cord protects your computer two ways!



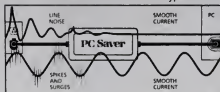
Surges, spikes and line noise cause computer errors.

The circuitry inside your personal computer and peripherals depend upon a clean supply of AC line voltage. Computers and peripherals are very susceptible to surges, spikes and line noise. These voltage anomalies are caused by ordinary activities such as the start and stop of elevators, operating home appliances, even switching lights on and off.

You may already be familiar with the results. Crashed software. Garbled files. Memory losses. Even damage to your computer's sensitive circuits.

Unique 2 step protection.

First, it filters the current from the wall outlet. Designed to IEEE specifications, the PC Saver Line Cord quickly clips surges and spikes to a safe 133 volts RMS/175 volts DC level and filters transverse and common mode noise with an 'L' type filter.



Second, the PC Saver Line Cord filters noise generated by peripherals within your system. For example, a printer and computer are connected to an outlet strip. Operating the printer generates noise which feeds back through the outlet strip into the computer causing software errors and possible hardware damage. With its protective circuitry the PC Saver Line Cord eliminates this problem.

Fits most personal computers.

The PC Saver Line Cord fits almost every make of personal computer, such as the IBM PC™ and XT™, all Apples™, Texas Instruments™, DEC™, WANG™, Compaq™, Victor™, Kaypro™, Osborne™ and many more. Simply replace your factory supplied power cord with the PC Saver and your system is assured maximum protection.

PC Saver Line Cord: outstanding value.

At only \$39.95, the PC Saver Line Cord gives you better performance than products at twice the price. Available at computer stores everywhere or direct from Kensington Microware Ltd. 919 Third Avenue, New York, NY 10022, (212) 486-7707, Tlx: 236200 KEN UR. For phone or mail orders please include \$2.50 shipping and handling. New York State residents add applicable sales tax. Visa and Mastercard accepted.



CIRCLE 275 ON READER SERVICE CARD

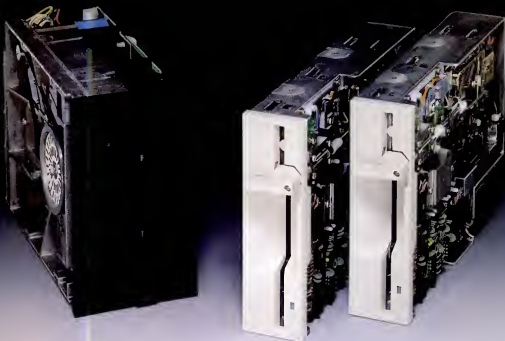
PC Saver was tested to the Institute of Electrical and Electronics Engineers (IEEE) specification 507 1980, Category A. Also available in 220-240 volt model.

specification 507 1980, Category A. Also available in 220-240 volt model.

PC Saver—trademark of Kensington Microware Ltd.

© 1983 Kensington Microware Ltd.

double sided
double density



Plug compatible with standard 5¼" drives, but occupying just one-half the space, these Amdisk-V minifloppy disk drives are engineered for solid performance and reliability... and they're available now!

Drives are available with black faceplate.

Just circle the reader service number for complete specifications and quantity pricing.

2201 Lively Blvd. • Elk Grove Village, IL 60007
(312) 364-1180 TLX: 25-4786

REGIONAL OFFICES: Calif. (714) 662-3949 • Texas (817) 498-2334

CIRCLE 105 ON READER SERVICE CARD

AMDEK

Amdetek... your guide to innovative computing!

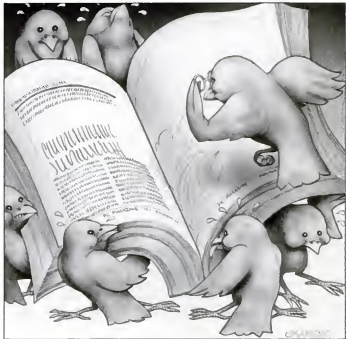
In its march to the front of the personal computer parade, IBM has cleared a trail for a herd of fortune seekers. Among the winners, count the makers of PC compatibles, Charlie Chaplin bowler hats—and guess who else?

Another PC Success Story

October was a horror story as we at PC Magazine paid homage to Halloween with tales of the poltergeists, goblins, and demons that are sometimes attracted like moths to the flame of an IBM PC. This month we take note of the fourth Thursday in November as we give thanks for things that work. And, we make an announcement to our readers. . . .

Now, of course, we all know that IBM is the biggest success story of them all, thank you, with its initial foray into the no-longer-little world of microcomputing. They ain't saying, and we can only estimate that there are already several hundred thousand cute beige, tan, and black IBM PCs out there, and the factories are on triple shift cranking out more. IBM has regained its preeminent position in the computer world, leaving every would-be challenger in corporate terror of Big Blue's next earthquake.

But why dwell on the obvious? Like the sparrows that follow the parading elephants at the circus, a whole industry made up of hangers-on and supporting characters has sprung up in IBM's wake. These consummate capitalists thrive on filling the gaps IBM deems too small to bother with.



Let us consider, for example, the suppliers of those silver stickum patches included in every box of floppy disks, which serve as temporary write-protection for programs. I don't know about you, but I always manage to end up a sheet or two short after having used up my supply in a conservation-minded security binge, or, more likely, after having lost the stickers in the swamp of my desktop. (Remember desks?) I've even resorted to cannibalizing unopened boxes of floppies—don't need the disks yet, just the silver tabs. Somebody must be making a fortune on those stickers. Why didn't I think of that?

And how about the manufacturers of all of those disk envelopes? You know, the ones you always seem to have too many of when you don't need them, and too few when you do. Most of them are made of something called Tyvek, a modern synthetic equivalent of chain mail. I once got a letter in a Tyvek envelope sealed with an extra layer of fiberglass tape. I broke two letter openers and dulled my best Swiss

Army knife before I finally rescued the junk inside and threw it out. Anyhow, Phineas T. Tyvek, or whoever you are, are you happy tonight?

P HINEAS
*T. Tyvek, or whoever
you are, are you happy
tonight?*

Of course, you're sure to have noticed how linen-covered cardboard slipcases are suddenly in vogue. It all started with IBM's instruction manuals, but now almost everything—including a press release received here—is encased thusly. I thought those boxes had gone out with piano rolls and mustache wax. (Speaking of mustache wax, I'll bet the manufacturers of Charlie Chaplin bowler hats and

canes are putting in extra hours these days.)

And, need I say, each of those slipcases includes a plastic disk holder. (The cheaper programs have given new life to the zip-lock bag vendors.)

Now, I'm not sure if you are aware that New York City doesn't give ticker-tape parades anymore. You see, there no longer is any such thing as ticker tape, now that stock quotes are all bits and bytes in an electronic datastream. But somewhere, I imagine, somebody has cornered the market on all the punched-out sprocket holes from tractor-feed printing paper. I can see a growing mountain of white dots—perhaps they'll put in a chairlift and start America's first all-year ski resort, Mount Charlie.

And despite the best efforts of dozens of modem manufacturers and communications software writers, no one has completely succeeded yet in supplanting the warm, secure feeling of opening a Federal Express envelope in the morning. Someday, when a disk full of

1040
TAX SYSTEM

TAX\$IMPLE

1040
TAX SYSTEM

IT IS INTELLIGENT: It analyzes the client's tax picture, suggests the forms you should fill out.

IT IS A POWERFUL TOOL FOR PLANNING AND PROJECTING: With the TAX\$IMPLE you can make various assumptions and test various strategies like "What If I income average or do not income average" in a matter of minutes. It has 1040 and sixteen other forms.

IT DOES ALL THE CALCULATIONS FOR YOU: Change any entry and all the entries on the form are immediately revised. It also transfers relevant information to other forms.

IT IS USER FRIENDLY:

- It is menu driven.
- It has full screen editing capability for entering tax information.
- It has scratch forms for storing raw tax information.
- It has split screen capability that will let you project, simultaneously, on the screen any one of the forms and any one of the scratch pads.

IT IS A COMPLETE TAX RETURN PREPARING TOOL: Prepare your tax returns using either form transparencies or multicopy perforated IRS forms or official IRS forms.

The cost of TAX\$IMPLE — 1982 \$70, — 1983 \$200

Call or write for details and our money back offer:

AJV COMPUTERIZED DATA MANAGEMENT, INC.

44 Center Grove Road, Q-7, Randolph, N.J. 07869 • (201) 989-8955

• 1983

CIRCLE 494 ON READER SERVICE CARD

information absolutely, positively has to get there overnight, we'll all dial each other up and let our PCs do the talking. Until then, send for the Pony Express. (By the way, those envelopes are made of old friend Tyvek.)

And there's one other group of essential peripherals for most microcomputer owners I know. Why in the world didn't I buy stock in the parent companies of Bayer Aspirin, Alka Seltzer, and Tums?

But, alas, all is not roses in the shadow of C. Chaplin's favorite machine. As that great American sportsman George Stainbrenner might say, "In order to have winners, you've got to have losers."

To begin with, think of your poor overburdened mailman on the day PC Magazine is delivered. In particular, think of the guys with postal routes in Silicon Valley or Boca Raton. They've got a load on their shoulders.

And how'd you like to be the Amalgamated Paper Spreadsheet Company? I'd imagine their books are showing a fair amount of red ink these days; that is, if the

books are not already converted to an electronic calcsheet, in which case they're bleeding red phosphor instead.

Don't overlook green ayeshades, pink

WHY IN THE world didn't I buy stock in the parent companies of Bayer Aspirin, Alka Seltzer, and Tums?

pencil erasers, and celluloid cuff protectors, either. We've got them on the list, too. Will none of them be missed?

But, oh, I almost forgot one other big winner in the Great IBM PC Explosion. You and me, folks.

Micro-Corporeal Success

Another beneficiary of success—how

permanent remains to be seen—is the throng of PC-competible manufacturers who are competing for market share on the basis of price or features.

I had lunch recently with the president of one of these companies—a very knowledgeable and candid man, very sure of himself and of his company. On the promise of anonymity, we began a discussion about the economics of production.

The average price of the company's line—as it goes out the door of the factory and before any markups—is about \$2,000. I asked the president, "Right now, if you were able to take advantage of every available cost-saving mechanism, including VLSI chips and automated assembly and testing, and could obtain resources at the optimum economy of scale, could you make a profit on these same machines at \$1,000?" His answer was an unequivocal "yes." In fact, he went further and said that technology and methods already in the pipeline should make it possible to earn a profit at a wholesale price much less than \$1,000 for the same or even o

SOFTWARE DEVELOPERS

Save thousands of dollars! Save hundreds of hours!

by using our assembly language sub-systems

FABS

fast B-tree keyed access sub-system

- Rapid access and maintenance of large files with fixed-length records
- Versions available for CP/M-80, MP/M-II, CP/M-86, MS-DOS, PC-DOS, Microsoft BASIC(s), COBOL, FORTRAN, PASCAL, PLI, CBASIC, CB80, CBASIC86, CB86.
- FABS directs all Access, Insert, and Delete file operations
- Key length may be greater than 50 bytes, and six key files open simultaneously
- Multiple primary key and multi-level key plus duplicate and variable-length keys are supported
- Random search time approximately 1 second, sequential step 1/4 sec.
- Deleted records are automatically reclaimed by subsequent insert operations
- Key files never need to be re-sorted: excellent error handling
- Generic search returns the first occurrence of partial key; search-next provides sequential read
- Loads resident with DOS, occupying less than 15k bytes
- Easy to incorporate into existing file-intensive applications
- Extensive commands: Create, Open, Close key file, Search (first, last, next, previous, generic), insert, Delete, Replace key, Max Length, Open Deletes, # of Records, # of Keys

AUTOSORT

high speed Sort/Merge/Select sub-system

- Optimized for very large files; stand-alone or callable subroutine; diskettes may be changed during operation
- Versions available for CP/M-80, MP/M-II, CP/M-86 and MS-DOS, PC-DOS running Microsoft BASIC(s), FORTRAN, PASCAL, CBASIC, CB80, CBASIC86, CB86.
- Record size may exceed 5000 bytes, and file length is unlimited
- Sorts based on up to 10 fixed or variable length keys, each ascending/descending
- Key fields may be string, integer, single or double precision numeric
- Output files may consist of full records, key with record pointer, and record pointer only
- Select for retain/delete based on up to 4 keys, AND, OR, >, <, =, conditions
- Single or multi-user; sorted files may be merged
- Fast . . . 4000 records of 128 bytes sorted to give key and pointer file in 170 seconds
- Boot straps itself into and out of memory claiming/restoring memory automatically
- Up to 9 different Sort/Merge/Select Modes of operation; parameters defined at run-time or read from a file
- Interactive parameter set-up program is supplied; files may be on disk drives A-Z

Retail Price \$150 Each + Shipping (OEM Dealer Discounts)
COMPUTER CONTROL SYSTEMS, INC., 298 21st Terrace S.E., Largo, FL (813) 586-1886

Professionals™

DEALERS
WE BUY
EXCESS
INVENTORY



IBM is a trademark of IBM Corporation

IBM-PC
System Includes
Two 320K Disk Drives by CDC
90 Day Warranty By Us
Call For Details And
Configurations

	LIST PRICE	OUR PRICE
MEMORY CHIP KITS Add-on to your memory cards or motherboards. 100% tested. With 90-day warranty.		
44K Kit 200MB, 4 chips, 4.5M	\$ 150	\$ 49
44K Kit 400MB, 4 chips, 4.5M	\$ 300	\$ 99
AMDEK 4.1M+ Multiple-board, Color Graphics, Memo 128K	\$ 509	\$ 379
CompuPac, 64K or any, any cards & clock controls	\$ 305	\$ 279
Atari CompuPac, 64K or any, any cards & clock controls	\$ 305	\$ 279
Apple II, 64K, 2 S.P.C. and software	\$ 495	\$ 349
256K, 2 S.P.C. and software	\$ 795	\$ 499
Expand 528K MegaPac, I/O 512K Kit	\$ 305	\$ 209
CCS SuperMac, microchrome 120/24, 44K video board	\$ 850	\$ 609
256K, 3M, 256K, 44K, expand to 192K, 44K card	\$ 475	\$ 349

HARDWARE

[illegible]

\$45 \$40 Top of room

64K CHIP KIT
4064 200 pin MEMORY EXPANSION
90 Day Warranty on kit

\$256 ESTD 1982

256K RAM BOARD
Fully Compatible 2 Year Warranty by Corsair
Aspiral RAM Disk Emulator and Spooler Software
Works on DOS 1.1 or 2.0

★ Means a BEST buy. **AD #982**

SOFTWARE

BUSINESS			BUSINESS		
		LIST PRICE			LIST PRICE
ASHTON-TATE	Microsoft requires PC DOS 3.29	\$ 100	MULTISTEP	DirectCalc: multi-step calculation of spreadsheets	NEW
	Excel 3.00 (1.5 update by Software Data)	\$ 190		NORTH AMERICAN BUSINESS SYSTEMS: The Answer	\$ 250
	Everyday 101 Primer (Books)	\$ 15		CDROM: COM (from 1 disk: Business, Statistics & Mail Programs)	
	The Finance Primer	\$ 12		Some 100+ Basic Programs (100+)	\$ 150
	Traders	\$ 90		Practical Basic (Basic, Mail, programming)	\$ 135
APPLIED SOFTWARE TECHNOLOGY	Variations	\$ 385	PBL CORPORATION	Personal Finance	\$ 145
COMPATIBLE	Thompson: MCDOS 3.29 (update)	\$ 15	PEACHES SOFTWARE	Peaches: AFR & API Series 1	\$ 195
	PCW (Flying Calculators, Mailings)	\$ 125		Peach Tree 3000 (MCDOS)	\$ 325
	Program Management	\$ 495	PERFECT SOFTWARE	Perfectly Brief	\$ 389
DATABASE: Word Calc (Database Programs)		\$ 40		Perfect Screen 3 or Perfect Calc 3	\$ 250
DOJONES Market Analyzer		\$ 225	SOFTWARE ARTS	Typed View	\$ 395
	Market Manager	\$ 300	SOFTWARE PUBLISHERS		\$ 290
	Market Manager	\$ 170		PPS Files	\$ 195
EAGLE SOFTWARE	Money Decisions	\$ 120		PPS Report	\$ 125
ENSTEN	View	\$ 200		PPS View	NEW
	Money	\$ 80		PPS Graph	NEW
	Memory Tracker (MCDOS)	\$ 250	BONICK	Super Calc 1	\$ 290
	Thompson: MCDOS 3.29 (update) graphics adapter	\$ 15		Super Calc 2	\$ 290
	IBM for IBM PCs/XTs	\$ 99	ETOWNE	EX- Master (1 CDROM)	\$ 130
HAVERD	IBM PC/XT	NEW	ENHANCE	ENHANCE: Personal Finance	\$ 490
HOWARD	IBM PC/XT	NEW		ENHANCE: Personal Finance	\$ 490
INFORMATION UNLIMITED	Excel 3.00 (1.5 update) (Word Programs)	\$ 320	MAKERS	Maker II	\$ 275
	Excel 3.00 (1.5 update) (Word Programs)	\$ 320	WISCOM	WISCOM: BUDGET	\$ 250
	Excel 3.00 (1.5 update) (Word Programs)	\$ 320		WISCOM: WISCOM: WISCOM	\$ 250

UTILITY & SYSTEM

2003 CL SOFTWARE AWARD

Copy II PC by Central Point Software is the best CL software buy of 1990. It will copy most copy-protected software and faster than any other backup system. Unlike other copiers, it makes an exact duplicate of your original and it does 100% verification of copy documentation is excellent.

	LIST PRICE	OUR PRICE
★ CENTRAL POINT Copy-RPC Backup and Utility	\$ 40	\$ 38
★ COMEX Fastwin - RAM Disk emulator and printer spooler program enables PC DOS version 3.31 Ram Card Menu, Driven - NEW!	\$ 150	\$ 95
DIGITAL RESEARCH Conquest OFP-86 *	\$ 250	\$ 225
CRASH 86 *	\$ 200	\$ 175
CP 86 *	\$ 40	\$ 40
Fascist MT - (CP/M 86)	\$ 400	\$ 325
Fascist NT - (MSDOS)	\$ 400	\$ 325
PL-1 (MSDOS)	\$ 750	\$ 599
Access Manager (MSDOS)	\$ 800	\$ 719
Display Manager (MSDOS)	\$ 500	\$ 429

[HOME & EDUCATION](#)[illegible]

THE WORLD'S LARGEST COMPUTER MAIL ORDER FIRM

CONROY-LA POINTE™

Formerly **Computer Exchange**

SHOWROOMS AT: 11507D SW PACIFIC HWY., PORTLAND, OR. OPEN M-SAT 10-5
23068. Portland, OR 97223 SEATTLE, WA OPEN M-SAT 10-5

CIRCLE 160 ON READER SERVICE CARD

NATIONAL
ORDER DESK **TOLL FREE**
(800) 547-1289

Order Desk Hours: 6AM to 6PM PST

Oregon TOLL FREE (800) 451-5151 Portland 345-6200	Hot Line For Information On Your Order (503) 245-1030
---	---

more copable machine.

What, then, does this mean in terms of the much-awed burgeoning of the home market for microcomputers? Well, he said, it should be obvious that this company, or a similar not-small-but-not-huge firm could compete with IBM in the low end of the market on the basis of price, even with an American-made product and even more so if the manufacture was moved offshore. But, at the same time, it should be obvious that this company, or a similar one, cannot hope to compete with a low-priced home machine if that product has IBM's name on it and IBM's promotion budget behind it. "A \$10-million ed campaign is just lunch money for them," he said. Therefore, the president added, his company will not compete in the home market and will instead concentrate on the high-end market.

But all is not simple there, either. The traditional strategy for IBM's hangers-on in the past (the "plug-compatible" manufacturers in the mainframe market) has been to surround IBM's product line in

terms of price and capabilities. That's not going to happen if the compatible makers truncate their arc at IBM's business machines, presumably the PC, PC-XT, and other improvements to come.

And think about this: If this comparatively tiny IBM-compatible manufacturer's \$2,000 selling price includes the potential for more than \$1,000 in profit for a PC-like machine, think what big IBM's profit margin could be. Or, think how low IBM could drop its price to maintain its market share if it chose to.

And then think about how close in price an IBM PC or a compatible PC priced at \$1,000 retail would be to the home machines in the \$600 to \$1,000 range.

Let us think that all of this talk of monumental price restructuring is a bit premature, take the opportunity to mosey on down to your neighborhood computer store and peek beneath the hood of the "new" Apple IIe—the latest upgrade and rework of the original Apple II. There is nothing inside! Well, almost nothing. The whole shebang, with its single board and

custom chips (not to mention its already-established market recognition and amortized design end plent), can't be costing Apple more than a few hundred dollars in total.

And Now, the Envelope . . .

We promised an announcement at the top of this column, but we wanted you to read a bit about the marketplace first. Now then, in case you somehow didn't realize it when you wheeled your copy of PC Magozine into your office or your living room today, you're bolder another success born of the IBM PC. This magazine and our sister publications PC Technical Journal and PC Disk Magozine, together with a few other publications we understand are also on the market, are the most visible reflection of the length of IBM's tuxedo tails.

PC Magozine has been getting bigger (and, we hope, better) with every issue. But the size is still a problem—to our writers, to our editors, to our typesetters, to our art department, to our printers, to the Postal Service, and most importantly, to our readers.

And there is another problem: So much is happening in the world of IBM PCs—hardware, software, and compatibles—that at times, a month seems like an eternity. The fact is that as you read these

YOU'RE holding another success born of the IBM PC.

words in November, we should be putting the finishing touches on our February issue. But these are not ordinary times.

We are pleased to announce that, commencing with an issue dated January 17, 1984, PC Magozine will be published every 2 weeks. You can expect a slightly slimmer, more timely, and still-improving magazine.

As a bonus to our subscribers, we will extend subscriptions to cover the time period remaining. If you have 2 years to go on your 3-year subscription, you will receive the next 52 issues of PC—28 extra issues at no additional charge. Now that's a successful bargain. /PC



Flight-Command puts YOU in the cockpit!

A Software Program for IBM-PC*

Experience a whole family of flight simulators in one package:

- Cessna 150
- Pitts Special
- P-51 Mustang
- F-14 Tomcat
- Boeing 747
- Concorde

Flight-Command* requires 80 column display and 64K RAM. PC DOS, BASICA

\$49.95 including instructions



Lighthouse
distributing

P.O. Box 10938 Bainbridge Island, WA 98110
206-842-5557

*IBM PC is a reg. T.M. of IBM Corp.

As pilot in command you will:

- taxi around airport
- get weather and tower information on the radio
- watch yourself on airport radar
- practice aerobatic skills
- use Autopilot to navigate the globe in a few minutes of real time
- use all controls: throttle, elevator, rudder, ailerons, flaps and brakes
- analyze your performance with flight recorder data from your printer

Washington residents add 7.1% sales tax

Name	_____
Address	_____
City State Zip	_____
Amount enclosed	_____
MC VISA #	_____
Exp date	_____

CIRCLE 254 ON READER SERVICE CARD

PC MAGAZINE 44 NOVEMBER 1983

IBM® PC Owners...

First we solved your printer problems

Now we give you

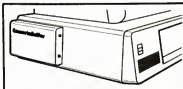


ConvertaBuffer™

IT'S A CONVERTER. There was a time when buying a letter quality printer meant giving up graphics. Now, however, ConvertaBuffer™ gives you the best of both worlds by allowing you to print the business graphs generated by programs such as MBA and 1-2-3 on letter quality printers such as Diablo and NEC. And, the quality of these graphs are as good as those drawn by dot matrix printers such as the IBM/Epson. ConvertaBuffer translates the Epson-format graphics data output from MBA, 1-2-3, and other packages with graphics capability into the format necessary for printing on a letter quality printer.

IT'S A BUFFER. Generating graphics requires the outputting of a large amount of data to the printer. ConvertaBuffer speeds this process by receiving the data as fast as your PC can send it — 1,000 characters per second; storing up to 64K bytes of data in its built-in memory buffer; and then sending it to the printer at the printer's slower speed — 25 to 55 characters per second. This allows you to go on to other work without having to wait for the printer to finish printing.

EASY TO INSTALL. ConvertaBuffer comes with its own built-in cables which plug directly into your PC's printer adaptor and your printer's cable without removing the cover of the system unit — there is no need to buy an extra cable. And, each unit has its own fully regulated DC power supply — the unit does not steal power from the PC or the printer.



ConvertaBuffer also features a convenient front panel switch which resets the buffer to abort the printer output if desired. And, the status light indicates when ConvertaBuffer automatically switches to the graphics mode.

HAVE YOUR CAKE AND EAT IT TOO! The parallel-to-parallel ConvertaBuffer for graphics is the latest member of the ConvertaBuffer family. The original ConvertaBuffer enables you to connect any RS-232C serial interface equipped printer directly into the parallel printer port of your PC with up to 32K bytes of printer buffering.

Ask your dealer about ConvertaBuffer for graphics and the original ConvertaBuffer. Or contact us.

von Leivendyke

ENTERPRISES

Silvermine Avenue

Norwalk, Connecticut 06850

203-846-4973

Please send me further information on () graphics () original ConvertaBuffer.

I have a _____ printer, with () parallel () serial interface.

Name _____ Phone () _____

Street Address _____

City _____ State _____ ZIP _____

IBM is a trademark of International Business Machines Corp.
MBA is a trademark of Context Management Systems.
Diablo is a trademark of the Xerox Corp.

1-2-3 is a trademark of Lotus Development Corp.
Epson is a trademark of Epson America, Inc.
NEC is a trademark of NEC Information Systems, Inc.

BANC ON US!

Banc on us to keep your best interest in mind!

Don't just buy software - *invest* in it! Even the best software can be limited without the right support services. *Who* you buy from is just as important as *what* you buy.

Support

Being in a very competitive business, we strive to out-do ourselves by anticipating and satisfying our customers' needs. SoftwareBanc provides the best sales and technical support money can buy - *free* of charge.

Confidence

Our customers prove their confidence in SoftwareBanc by referring their friends and business associates to us. Well over half of our sales come from referrals or repeat customers.

Quality

We offer only quality software and we support it completely. Our select line of products will fill your data management, word processing and financial management needs.

Get the highest return on your software investment - from SoftwareBanc!

Prices You Can Afford . . .

t1-2-3	\$399
tdBASE II	\$479
tABSTAT	\$379
dBASE II USER'S GUIDE	\$ 29
tDBPLUS	\$ 95
dGRAPH	\$199
dUTIL	\$ 69
dNAMES	\$109
FRIDAY!	\$199
QUICKCODE	\$199
*TEXTRA	\$ 60
WORDSTAR	\$269
SPELLSTAR	\$149
MAILMERGE	\$149
STARINDEX	\$149

tNo-Risk 60 Day Money-Back

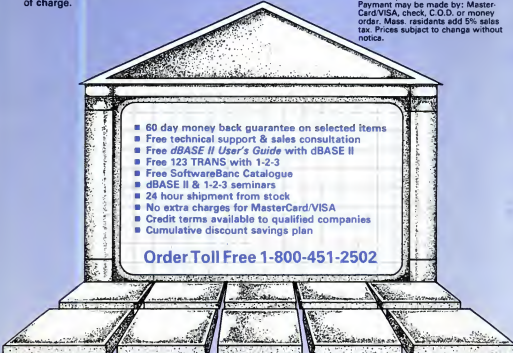
Guarantee.

*Only available for IBM PC with MS-DOS.

SAVINGS PLAN DISCOUNTS NOT REFLECTED.

Dealer Inquiries Invited.

Payment may be made by: MasterCard/VISA, check, C.O.D. or money order. Mass. residents add 5% sales tax. Prices subject to change without notice.

- 
- 60 day money back guarantee on selected items
 - Free technical support & sales consultation
 - Free *dBASE II User's Guide* with *dBASE II*
 - Free 123 TRANS with 1-2-3
 - Free SoftwareBanc Catalogue
 - *dBASE II* & 1-2-3 seminars
 - 24 hour shipment from stock
 - No extra charges for MasterCard/VISA
 - Credit terms available to qualified companies
 - Cumulative discount savings plan

Order Toll Free 1-800-451-2502

SoftwareBanc

661 Massachusetts Avenue, Arlington, MA 02174

To order call: 1-800-451-2502, 1-617-641-1241 in Mass., for Technical Support, 1-617-641-1235

Hours: Mon-Fri: 9am - 8pm e.s.t., Saturday: 9am - 5pm e.s.t.

CIRCLE 732 ON READER SERVICE CARD



ADAM B. GREEN



Taught by the nation's leading dBASE II expert, Adam B. Green, whose dBASE II User's Guide has sold over 30,000 copies.

"Green doesn't just teach dBASE syntax, he establishes the fundamental terminology and organization behind data-base management systems."

dNEWS - Ashton-Tate

Teach your computer who's BOSS!

Attend a dBase II or 1-2-3 SoftwareBanc Seminar

Here are just a few of SoftwareBanc Seminars' clients:

ABC	Digital Research	Pricewaterhouse
Arthur Andersen	Dunn & Bradstreet	RCA
Boeing Aerospace	E.F. Hutton	Shell Oil
CBS	Fox & Keller	U.S. Air Force
Chase Manhattan Bank	IBM	U.S. Navy
Citibank	Internal Revenue Service	U.S. Postal Service
Computerland	Laventhol & Horwath	Victor Business Products
Cornell University	Merrill Lynch	Westinghouse
Digital Equipment Corp.	Osborne Computer Corp	Xerox
	Polaroid Corp	

1983 Schedule of Classes

Dallas
November 14-18
AMFAC

Washington, D.C.
January 9-13
Hyatt Crystal City

San Diego
December 12-16
Hyatt Islandia

Orlando
February 6-10
Hotel Royal Plaza

4 Days of Instruction

9:00 A.M. to 5:00 P.M.

- dBASE II Fundamentals
- dBASE II Programming
- Advanced dBASE II
- Problem Solving with 1-2-3

State of the Art Presentation

- Video and sound system
- Video tapes of program authors
- Buffet Lunch/Coffee Breaks
- Portfolio of Comprehensive Seminar Notes

\$175 Per Day of Instruction

Your required pre-payment may be made by:

MasterCard, VISA or Check.
Call or write to register

NOTE: All expenses for continuing management education (including registration fees, travel, meals and lodging) undertaken to maintain and improve professional skills are tax deductible.



CIRCLE 758 ON READER SERVICE CARD

SoftwareBanc Seminars

661 Massachusetts Avenue
Arlington, MA 02174
(800) 451-2502 (617) 641-1241 in MA



Repeat it once more... "No manual tax preparation in '84"

Micro-Tax* can turn your personal computer into a profit center—you'll increase your client volume and take the drudgery out of tax preparation. And since the returns never leave your office, you have complete client security.

MICRO-TAX* IS COMPREHENSIVE. It offers three Federal tax packages and 23 fully integrated state packages, so you can select the programs that best meet your needs. Level II has a tax depreciation module, and it automatically computes underpayment penalties, self-employment taxes, minimum taxes, and income averaging. For those who prepare Federal partnership, corporate, and Subchapter S returns, Micro-Tax* has a Federal Level III package. Each tax season Micro-Tax* offers you an update package.

MICRO-TAX* IS VERSATILE. The program is compatible with your IBM PC* or XT*, DEC Rainbow*, Radio Shack*, or any other personal computer with CP/M*, PC DOS* or MS DOS*—from Apple* to Zenith*.

Instead, save yourself time and money and satisfy your clients with your personal computer and...
MICRO-TAX*



MICRO-TAX* IS FLEXIBLE. It's up to you; you can input the client tax information at the time of interview and produce the forms immediately, or enter data during the day and batch print returns at night. Micro-Tax* prints your returns on IRS forms, IRS approved substitute forms, or with transparent overlays.

MICRO-TAX* IS FRIENDLY. You can organize data entry in a sequence very similar to that of manual tax preparation, or you can compute forms out of sequence. It's up to you. So go ahead, repeat it once more...

"No manual tax preparation in '84."
No need—once you've got Micro-Tax*.

Call Micro-Tax* direct for complete details, or call your local dealer.

Prove it to yourself, order a demonstration package—a complete 1982 Federal, Corporate/Partnership or State system for only \$58.00 each.

FULL FEDERAL MICRO-TAX* PERSONAL COMPUTER SYSTEMS	1983 FEDERAL FORMS AND SCHEDULES INCLUDED																							PRINTS
	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064
Level I, Individual \$195	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Level II, Professional Individual \$1,500	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Level III, Partnership/ Corporate \$15,000	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Level IV, Overseas \$2,000	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

* All forms and schedules subject to final IRS changes for 1983 tax year.
* 25 integrated state returns available * Orders issue for yearly update packages

* C PM—trademark of Digital Research, Inc. DEC Rainbow—trademark of Digital Equipment Corp. MICRO-TAX—trademark of Microcomputer Taxsystems, Inc. MS DOS—trademark of Microsoft Corp. PC DOS, IBM PC and IBM XT—trademarks of IBM. Apple—trademark of Apple Computers, Zenith—trademark of Zenith Computers and Zenith Radio Corp. Radio Shack—trademark of Tandy Corp.

MICRO-TAX* MICROCOMPUTER TAXSYSTEMS, INC.
6203 Varrel Avenue, Suite A Woodland Hills, CA 91367
Dept 1D Phone (213) 704-7800
CIRCLE 312 ON READER SERVICE CARD

EROS

'Dedicated to Your Satisfaction!'

**LOW, LOW PRICES!
GREAT SERVICE!**

What more can you ask for!



PERIPHERALS FOR ALL COMPUTERS

PRINTERS:

STAR MICRONICS:

GEMINI 10X:	
The Improved & updated 10	\$CALL
GEMINI 15X	\$CALL
SMTA CORONA:	
TP1	\$549.00

CITOH:

Prowriter I	\$ 369.00
Prowriter II	\$ 699.00
F-10 Starwriter	\$1190.00
F-10 Printmaster	\$CALL

JUKI:

The New! LQ Printer	
16CPS	\$ 539.00

OKIDATA:

Microline 92	\$463.00
Microline 93	\$915.00

CALL FOR PACEMARK PRICES!

DISKS:

Kangaroo: With library case

and 10 year warranty!	
5 1/4" SS/DD (Box of 10)	\$19.50
5 1/4" DS/DD (Box of 10)	\$28.50
5 1/4" SS/DD (Box of 5)	\$14.50
5 1/4" DS/DD (Box of 5)	\$22.50

Verbatim:

5 1/4" SS/DD (Box of 10)	\$23.95
5 1/4" DS/DD (Box of 10)	\$43.95

Dysan:

5 1/4" SS/DD (Box of 10)	\$30.95
5 1/4" DS/DD (Box of 10)	\$38.95

MONITORS:

Amdek:

Color I	\$299.00
Color II	\$449.00
310G Green	\$132.00
300A Amber	\$147.00
300G Green	\$132.00
Texas: Amber 12"	\$140.00
Precision Graphics System:	
RGB Hi-Res - Spruced too low!	
Zenith: ZVM 121 Green	\$ 99.00

MODEMS:

Hayes:

Micromodem II	
with terminal program	\$309.00
without terminal program	\$279.00

Smartmodem

300 Baud	\$216.00
1200 Baud	\$529.00

Novation:

J-Cat	\$116.00
AppleCat II	\$299.00
SmartCat 1200 Baud	\$464.00

HARD DISK DRIVES:

DAVONG:

(IBM, Apple)	
5MB	\$1339.00
10MB	\$1739.00
15MB	\$2139.00

DISK DRIVES:

Fourth Dimension:

With Controller	\$270.00
Without Controller	\$220.00

PRODUCTS FOR YOUR IBM-PC®:

MBI:

I-C-MAGIC: Programmable Graphics Screen Dump From Chip	\$CALL
Monte Carlo™ GT™ Card	\$CALL
Monte Carlo™ Quatro™ Card	\$CALL

T&G Products:

Joysticks	\$39.00
Trackball	\$49.00
Kraft Products:	
Joysticks	\$49.00
Game Paddles	\$35.00

Quedram Corporation:

Quad Board: 64K	\$CALL
Microtizer	\$CALL
Maynard Electronics:	
Floppy Disk Controller:	
Parallel	\$209.00
Serial	\$239.00

SOFTWARE:

Infocom:

Zork I	\$29.50
Zork II	\$26.50
Zork III	\$26.50
Deadline	\$32.00
Lifetree Systems:	
Volkswriter	\$149.00

Continental:

Home Accountant Plus	\$99.00
Visicorp:	
Visidex	\$185.00
Visifiles	\$186.00
Visitrend/Plot	\$223.00
256K Visicalc	\$179.00

TANTALIZING SPECIALS!

TANDEN

100-2 \$234.00

55-2 \$234.00

RANA

Elite II w/o Controller \$262.00

Elite II \$411.00

COLUMBIA DATA PRODUCTS

MP3 Personal Computer

Features:

- IBM PC Compatibility • 128K Ram •
- 16 Bit Processor •
- 8 Expansion Slots/2 RS232C/1 Parallel •
- Floppy and Winchester controllers built in •

CALL FOR PRICES ON COLUMBIA'S NEW PORTABLE!

COMPUTERS IN STOCK:

IBM • APPLE • BASIS
NEC APC H01
Franklin ACE 1000/1200

Call for IBM PC and Apple IIe Prices

PRODUCTS FOR YOUR APPLE®:

SOFTWARE:

MBI:

VIP Graphics Card	\$119.00
Appletime Clock Card	\$ 85.00

Continental:

Home Accountant	\$49.00
On-Line:	
Screenwriter II	\$85.00
Silicon Valley Systems:	
Word Handler	\$130.00
List Handler	\$ 67.00

EXPANSION CARDS:

Microsoft:	
16K Card	\$72.00
CP/M Z80 Card	\$248.00
Generic:	
16K Card	\$CALL
Videx:	
80 Column Card	\$248.00
with Softswitch	\$CALL
Advanced Logic Systems	\$CALL

Visicorp:

Visicalc	\$185.00
Visifiles	\$186.00
Visicalc	\$179.00

T&G Products:

Joysticks	\$ 42.00
Game Paddles	\$ 28.00
Kraft:	
Joysticks	\$ 48.00
Game Paddles	\$ 33.00

EROS

For a Great Time, Call: 1-800-533-8987

P.O. Box 22573 • Minneapolis, MN 55422 • 1-612-535-4544

TERMS AND CONDITIONS: Payment: Personal checks are accepted although cashier's checks and money orders will be shipped first. VISA and Mastercard accepted—add 4% to total. Shipping: We calculate exact freight—for mail-in orders add 3% UPS GRD, 4% UPS BLUE - Monitors minimum \$5.00. Delivery: ASAP with 2-4 weeks on average. Price List: Features all of our up-to-date pricing. General: We replace or repair faulty goods at our discretion—refunds only at our discretion—no returns on software.

CIRCLE 245 ON READER SERVICE CARD

BLUE

COMES IN MANY COLORS



BLUE — THE WORD PROCESSOR

THE CHOICE ISN'T BLACK AND WHITE ANYMORE.

PRICE: \$150.00
MANUAL ALONE: \$25.00
DEMO DISK: \$10.00

DEALER INQUIRIES INVITED

IBM PERSONAL COMPUTER OR XT.
64K AND ONE DISK DRIVE.
DOS 1.1 OR DOS 2.0
MONOCHROME OR COLOR
GRAPHICS ADAPTER

WORKS
GREAT IN
MONOCHROME
TOO!

 **SYMMETRIC
SOFTWARE**

2005 BALBOA BLVD., SUITE 256
NEWPORT BEACH, CALIFORNIA 92663
(714) 887-8595

Introducing a graphics system to meet your every need, whether it's creating sophisticated presentations that integrate screens from your favorite programs — or expressing yourself with freeform drawings.



EXECUTIVE PICTURE SHOW

What Lotus™ 1-2-3 has done for spreadsheets, Executive Picture Show™ is doing for graphics.

Ordinary business graphics programs are fine as far as they go. But they are hardly the stuff of interesting business presentations.

If you need the ability to integrate and modify screens from other programs, such as Lotus 1-2-3, dBASE II®, CREATABASE, and WordStar™ — or just give free rein to your artistic side with free-form drawings — you've probably been frustrated on both counts.

Now there's a business graphics system that gives you these capabilities, plus the usual line, bar, 3D bar, horizontal bar, and surface and pie charts. It's the Executive Picture Show and it's long on capabilities where other programs fall short.

With Executive Picture Show you can create:

- free-form graphics
- business graphics
- slide show presentations
- animated presentations

Presentations to keep viewers on the edge of their seats.

Not only does Executive Picture Show accept screens from other programs, it lets you integrate them into your presentation where and when you want them. Then you can add the sound, motion, and color that insures a captive audience. Dropping in your company logo or making bar graphs take form right before your viewer's eyes is easy as pressing a few keys.

Executive Picture Show allows you to use both your IBM® monochrome and color monitors during your presentation. This means you can show a spreadsheet on your monochrome monitor, while a graph or drawing is formed on your color display.

Interactive presentations.

The Executive Picture Show was designed with you and the audience in mind. Not only does it allow you to de-

sign a moving presentation, it gives your viewers a chance to respond with more than enthusiastic reviews. They can actually input their responses so the program — and you — can act on their input.

Easy to use.

We had the business executive in mind when we designed this tool. That's why Executive Picture Show cuts through all the "computer-ese" to simplify instruction and prompts you throughout the program. We've reduced many steps to single key commands and included a handy reference card to help you get your show on the road.

Executive Picture Show is playing at a computer store near you for just \$195. If you want to preview this program, contact PCSoftware of San Diego directly for a demonstration disk and documentation priced at \$30.

Requires: Graphics adapter and display
128K RAM
2 disk drives or hard disk
IBM PC or IBM XT

Lotus 1-2-3, CREATABASE, and WordStar are trademarks of Lotus, PCSoftware of San Diego, and Micropro International Corp., respectively. dBASE II and IBM are registered trademarks of Ashton-Tate and International Business Machines, Inc.

CIRCLE 483 ON READER SERVICE CARD

Dealer inquiries invited.
VISA and Mastercard accepted.

Dealer orders contact:

Micro D	(CA) 800-432-3129
	(Nat.) 800-854-6801
Software Distributors	(CA) 800-252-4025
	(Nat.) 800-421-0814
Vitek	(CA) 800-237-7290
	(Nat.) 800-237-3443

Also available through Computerland Corporate.



PCSoftware™

PCSoftware of San Diego
Suite 416
9120 Gramercy Drive
San Diego, CA 92123
(619) 571-0981

ANNOUNCING:

PRO-JECT 6 AFFORDABLE PROJECT MANAGEMENT



FEATURES:

- Critical path automatically calculated
- Time schedule updated in real time
- Immediate "what if" analysis
- Full color or monochrome display
- Float time automatically calculated
- Projected completion date displayed after each change
- Bar chart or task details can be displayed
- Costs can be specified by task and resource
- Multiple work calendars supported
- Holidays and non-work days can be defined
- Progress can be reported with task completions
- Multiple resource types supported
- Critical Tasks highlighted
- Fast, flexible gantt chart window control
- Powerful, easy to use commands with "command-ahead" feature
- Supports daily, weekly and monthly projects up to 5 years long
- Sophisticated reporting system lets you design your own reports
- All reports can be previewed on the screen
- Cost and resource summaries can be printed

SYSTEM REQUIREMENTS:

IBM PC OR XT, 128 K- MINIMUM
ONE DOUBLE SIDED DISKETTE DRIVE
DOS 1.1 OR 2.0
80 COLUMN MONOCHROME
OR COLOR DISPLAY
PRINTER (RECOMMENDED)

ONLY \$149

CHECK, MONEY ORDER, VISA,
MASTERCARD ACCEPTED
FLORIDA RESIDENTS ADD 5% SALES TAX.

TO ORDER CALL (813) 799-3984

OR SEND CHECK OR MONEY ORDER TO

SoftCorp INC.
SUITE 244
2340 STATE ROAD 580
CLEARWATER, FL 33575
(813) 799-3984

PRO-JECT 6

CAN ANSWER THESE QUESTIONS:

- HOW CAN PROJECT COSTS BE MINIMIZED?
- IS THE PROJECT SCHEDULE REALISTIC?
- HOW CAN THE PROJECT BE SHORTENED?
- IS THE PROJECT ON SCHEDULE?
- HOW CAN RESOURCES BEST BE MANAGED?
- WHAT WILL THE PROJECT COST?
- WHAT TASKS REQUIRE CLOSE SUPERVISION?

FUN 'N' GAMES

GET 1 FREE WHEN YOU BUY 2 OR MORE!

These well-designed programs are educational for kids and fun for the entire family. For a limited time, we're offering you 1 free when you buy two or more of equal or greater value. All provide hours of enjoyment, and make great Christmas gifts too!

PC CRAYON

Is there an artist lurking inside you longing to create colorful pictures, animated displays and eye-catching slide shows? Let PCcrayon assist you! Anyone from six to sixty can quickly learn PCcrayon's powerful commands. And businesses can utilize "the Crayon" to create impressive presentations. Creations can be saved and re-used by your own programs. PCcrayon even creates hardcopy! Requires 64K, graphics adapter and display.

\$44.95



CONCENTRATE

Just try and see how accurate your memory really is! Based on the popular TV game show Concentration, players try to match squares and correctly guess the answer to colorful graphic puzzles. Educational for kids, and just plain fun for adults. Requires 128K, graphics adapter and display.

\$44.95



MY LETTERS, NUMBERS & WORDS

By Stone & Associates, Inc.

A pre-primary education software package for children from one to six. Children are taught the alphabet, the numbers from one to ten, and the concept of words through animated flash card routines and graphic displays. The program's attractive sounds and animated graphics will keep your children's attention and interest while they learn. Requires 64K, graphics adapter & display.

\$39.95



CHAMPIONSHIP BLACKJACK

Learn to win at the blackjack tables! You can improve your play with Championship Blackjack. Perhaps the best blackjack game on the market, Championship Blackjack features realistic color display with sounds, casino rules you can set, "pro" playing strategies, up to six players at a table with all cards always in view, "double exposure" and more! Requires 64K, any adapter and display.

\$39.95



ARMCHAIR QUARTERBACK

You're the quarterback! Lead your team to and-zone victory! A football strategy game including full representation of playing field, scoreboard with running clock and team statistics and overtime play. Play a trend or play your PC. No manual dexterity required. Requires 64K, any adapter & display.

\$39.95



CHESS 2001

The perfect chess partner! An elaborately designed program which offers detailed chess pieces represented on a chess board, six skill levels, no commands to memorize (the cursor keys control your moves!) Perfect for beginning chess players and excellent practice for intermediate players. Requires 64K, graphics adapter & display.

\$39.95



ORDER TODAY FOR YOUR FREE PROGRAM!

Call us at (619) 571-0981 and charge it to your Visa or MasterCard.

CIRCLE 484 ON READER SERVICE CARD



PCsoftware™
OF SAN DIEGO

9120 Gramercy Drive, Suite 416, San Diego, CA 92123 • Telephone (619) 571-0981

Share and share alike.



With SCS PCnet™, a true, low-cost network for IBM Personal Computers.

Share and grow with PCnet from Santa Clara Systems... the true local area network for the IBM Personal Computer (PC) and its MS-DOS operating System. PCnet allows the sharing of hard disks, floppy disks, letter-quality printers, modems, and internal memory by all networked PCs. So you can add new dimensions of capability to your system while reducing your per station costs!

True network news

With its proprietary, on-board intelligence, PCnet permits direct communi-

cation between all PCs in your network. If one goes down, the others don't. Unlike other network products, a dedicated disk server is not necessary, saving you money. In fact, no extra hardware is required to add more stations; just one PCnet board for each and you're set. Plus, PCnet is transparent to all IBM and compatible software.

Service for thousands

You have plenty of room to grow. And, as you add more users, your peripheral resource power and memory capacity increase linearly. For all that it offers, PCnet is surprisingly easy to install. Just plug a PCnet board into an I/O slot of each IBM PC you want to include in your network. Then tap into the standard coaxial cable—offered in lengths of more than one mile with PCnet!

The extras you'll like

You'll appreciate the specialized network utilities available with PCnet. Like print spooling, multi-tasking, and file-locking. Plus the ability to communicate with IBM PC look-alikes. In addition, the Pascal Bubble™ is supported under MS DOS.

Full customer support

Only Santa Clara Systems offers you worldwide support with PCnet. A full 90-day warranty. *And a complete line of hard-disk storage products tailor made for use with the PCnet, featuring up to a 1/2 gigabyte of storage per PC and removable Winchester cartridges for backup.*

See the difference sharing can make in your business. Our starter kit has everything you need to network two PCs right away—two PCnet boards, cable, and documentation. For more information, call or write us today!



**Santa
Clara
Systems, Inc.**

1860 Hartog Dr., San Jose, CA 95131
(408) 287-4640 / Telex: 176309 SCS SNJ

PCnet is a registered trademark of Ortel Technology
Pascal Bubble is a registered trademark of DATALIX

CIRCLE 426 ON READER SERVICE CARD



Three Reasons IBM Personal Computer Owners Should Use CREATABASE™:

• Ease • Power • Price •

CREATABASE is designed especially for your IBM PC.

Easy-to-use: CREATABASE lets you organize business and personnel information with just two simple steps to efficient record keeping. First, define a file by telling CREATABASE about the information kept in the file, and how it should appear on the screen. Second, type in your data as if you were filling out a form. Your data is now at your fingertips, to search, update, sort, and print.

CREATABASE is completely menu driven. Function key meanings are displayed throughout, so there's no need to remember command names or key assignments. Help screens are available at the push of a button.

CREATABASE fits on one disk to eliminate time consuming end-confling disk-swapping.

The CREATABASE manual contains a step-by-step tutorial to demonstrate all features.

Powerful: CREATABASE lets you add, delete, update information and reorganize your files with just the press of a button.

Screen designs and report layouts are completely under your control. Design your data input screen to look like a form you already use.

Our flexible report formatter lets you design reports, form letters, mailing labels, lists, invoices, etc.

CREATABASE data is even accessible from your own programs.

Inexpensive: At \$75, CREATABASE is the best value in information management software on the market today. Compare our features to our competitors, T.I.M.I.I.I.™, VisiFile™, and pfs: file & report™, and see for yourself.

General Features:

- Flexible screen design
- Flexible report design
- Full-field editing
- Key field for extremely fast access
- Fast and flexible assembler language sort routine.
- Process records in keyed, sorted, or entry order
- You can change key field at any time
- Add or delete fields without data re-entry
- Totally flexible search criteria on any or all fields
- Supports all printers and 80 column displays

File Features:

- Multiple files on one diskette
- Up to 1200 (64K) or 2200 records (126K) per file
- Entire file must reside on one diskette
- Maximum of 16 fields per record
- Possible field types and lengths are:
 - o — Alphanumeric (62)
 - A — Alphanumeric, All Capitals (62)
 - N — Numeric (14, with up to 13 decimal places)
 - D — Date (8, format is MM-DD-YY)

PCsoftware provides service and support for all its products.



PCsoftware™
9120 Gramercy Dr. #416
San Diego, CA 92123
619-279-2482

Order today.
Mastercard and Visa accepted.

	CREATABASE	dbase II	pfs: file & pfs: report	VisiFile	T.I.M.I.I.
Menu Driven	✓ (yes)	no	✓	✓	✓
Help Screens	✓	no	no	✓	✓
User-Designed Input Screens	✓	PN*	✓	✓	✓
User-Designed Lists, Form Letters Labels, Pre-Printed Forms	✓	PN*	no	no	no
Random Record Access by Key	✓	PN*	✓	no	✓
Sort Data	✓	✓	Output Only	✓	✓
Calculated Fields & Totals	no	✓	Output Only	✓	✓
Records per file	1200 (64K) 2200 (126K)	65535‡	1100 (DS Disk) 2200 (DS Disk)	32767‡	32767‡
Fields per Record	16	32	Variable	40 (64K) 128 (126K)	40
Types of Fields	4	3	1	5	8
Character/Field	62	254	1680	254	60
Character/Record	992	1000	2000 +	2048	2400
Especially Designed for IBM PC	✓	no	no	no	no
Retail Price	\$75	\$700	\$265	\$300	\$495

*PN Programming needed to provide this capability.

‡ In practice, disk capacity limits file size (e.g., a single sided disk with 200 characters/record will become full at about 700 records).

CIRCLE 492 ON READER SERVICE CARD

Letters To PC

Free Wares

PC's software reviews are invaluable sources of information. Your reviewers have recognized that often the best program for a job is not the most expensive. In fact, some of the best programs, like PC-Talk and PC-File, are free.

I have been offering a small statistical package to PC users free of charge. The program, called Epistot, is written in BASIC and can assist in the analysis of small- to medium-sized samples (fewer than 1000 observations per sample). It provides for data entry, editing, sorting, printing, graphing histograms, and saving data to disk files.

It also performs 34 common statistical tests or functions, including analysis of variance, binomial distribution, Chi-square test, correlation distribution, Poisson distribution, rank sum and signed rank tests, rate adjustments, sample size calculations, standard deviation, and Student's T-test.

Epistot requires at least 64K, a color/graphics adept, a monochrome or hi-res color monitor, and two 160K disk drives. I will be happy to distribute this program to readers who provide a 160K disk and a self-addressed, stamped mailer (or send \$20 and I will supply disk and mailer). Please specify color or monochrome version. My address is 1705 Gattis School Road, Round Rock, TX 78664.

Terry L. Gustafson
Round Rock, Texas

Foreign Connections

It was great to see Corey Sandler's article on David Hell's company, PC Connection ("Down By The Old Mill Stream," PC, Volume 2 Number 2). I have had the pleasure of doing business with Dave

from two different countries, first Canada and now the Netherlands.

Folks like me who live abroad don't have much protection from mail order houses, and we often must rely upon a friend's experience or just plain luck when ordering from an unknown.



Dealing with PC Connection has set a new high standard as far as I'm concerned. Dave has called back long distance to let us know if items were to be short-shipped or delayed, and customs documentation has always been perfect. If any of your foreign readers want a mail order house they can trust, I highly recommend Dave Hell's operation.

N.C. Helmkey
Uithoorn, Netherlands

A Note from Norman

I hope that your readers got all the way to the end of Stephen Manes's interview with me ("Marsha Norman: A Broadway

Playwright Collaborates With The IBM PC," PC, Volume 2 Number 3) and read that Dattel Systems did, in fact, come through. I now have the tractor feed that I griped so angrily about, and my card bracket was repaired the day after they received my letter. They are, it turns out, good people.

Let me add another bit of testimony, while I have you. This summer, I packed my PC, drove it to Lenox (Massachusetts) on a blazing hot day, and unpacked it for a summer's work in the woods. I was prepared for loose screws or blown circuits in both the PC and me, but it was a total success. No damage to either of us, and a new play to boot.

Marsha Norman
New York, New York

A Note on Norman

As an author who uses his PC only for word processing, I saw no need to subscribe to your magazine. Then I read the fine interview with Marsha Norman. My check is in the mail!

William Novak
Newton Centre, Massachusetts

The Right Mix

I was pleased to see John Woram's article, "The PC Sounds Off" (PC, Volume 2 Number 3), about the use of the PC in our Diskmix product and within our company. I hope that it will inspire other creative uses for the PC.

I would like to stress that my partner and co-founder in Sound Workshop is Paul Calbur. Paul has been chief engineer in charge of design and manufacturing since the company was formed, and he is equally responsible for the growth and success we have shared.

TEXTRA™ \$95



Leading the new generation in word processing...

Textra leaves behind the costly and complicated word processors of yesterday.

Leading in performance.

Most of today's word processors were converted to work on the IBM PC from their designs for yesterday's machines. If this seems like a step backwards, it is.

Textra was designed to take advantage of the speed and power in your IBM PC, and the result is clear—a word processor that helps you work faster with less effort.

Leading in learning.

Learning to use Textra is easy too!

Our highly acclaimed tutorial is actually a film on disk, rolling by on your screen. You can pause, change speeds, even fast forward or rewind, (and for the first time, have fun while learning to use a software program).

Leading in price.

Let's face it. The days of the \$495 word processor are numbered. There is simply no reason to pay that much now that Textra is here.

Take a closer look.

See for yourself how easy Textra makes word processing. Ask your dealer for a demonstration today, or order directly from us. Send \$95 with the confidence of a money back guarantee, or \$3 for a full Test Disk. (Visa/MC, COD accepted)

Textra also works with the PC XT and leading compatibles.

Textra requires PC DOS (any version), 128 K, and a monochrome or color monitor.

Textra and the A² Software logo are trademarks of Ann Arbor Software.
© 1983, Ann Arbor Software. All rights reserved.



A² Software

*Ann Arbor Software, 407 N. Main Street
P.O. Box 7545, Ann Arbor, MI 48107
Phone: 313-769-9088

Textra Jr. 39.95

**An outstanding text editor.
An outstanding price.**

Ideal for:
program editing • simple word processing
• dBase II™ programming • works with Visi-
calc,™ Supercalc,™ Lotus 1-2-3™

*P.S. You can upgrade to Textra at any-
time for the difference in price.*

TEXTRA

CIRCLE 117 ON READER SERVICE CARD

TM = Manufacturer trademark

Letters To PC

Although Sid Zimat was one of our original partners, he has not been associated with Sound Workshop for the past 5 years.

Since the article was written, we have eliminated all manual drafting. Our PCs now do 100 percent of our drafting chores in the engineering and marketing departments.

Michael Tapes
President, Sound Workshop Professional
Audio Products, Inc.
Hauppauge, New York

Starwriter is Word Perfect

In response to Lindsay Van Gelder's review of WordPerfect ("WordPerfect Reaches For The Star," PC, Volume 1 Number 11), we would like to clarify the fact that the Starwriter printer does indeed work with WordPerfect.

Special features (boldface, underlining, superscript, etc.) can be done on the Starwriter with WordPerfect if the user chooses the Quma 5 or 9 option from the print selection menu.

Brenda Atchison
Leading Edge Products
Needham, Massachusetts

RPG II Found

I was pleased to read Rick Manning's letter, "RPG II, Where Are You?" ("Letters to PC," PC, Volume 2 Number 3), because I, like Rick, have been programming in RPG II for over 13 years on several IBM/GSD systems. I feel that procedural languages like COBOL, Pascal, and BASIC are simply too time-consuming to write and offer no significant advantages to the development of a system.

For this reason, I was not very interested in micros until a recent news release led me to California Products of Santa Ana, California and its product, Baby/34. This package allows programs written for the S/34 to be transferred to the PC and run with no modifications.

Facilities are also available to do complete system development on the PC and pass the completed software back to the S/34.

At \$2,500, the price isn't low as far as PC software goes, but considering the product's scope, I think it is worth the money.

Russell L. King
Madford, Oregon

We'd like to thank all the readers who wrote in to bring this product to our attention. There are lots of RPG II fans out there!—Ed.

Self-Taught

We were very pleased with the review of Cdx products in the August issue ("User, Teach Thyself," PC, Volume 2 Number 3). Although it was generally accurate, a few items were either overlooked or misconstrued by Winn Rosch, the author.

The article states that we show how to use the training program on the disk but don't explain how to load the disk in the first place. As a standard practice, we included step-by-step instructions for using our training products in the reference guide supplied with every package.

Rosch mentions that the program does not run on the PC-XT. In fact, the program he reviewed was not designed for use on the XT. We have a new product that covers the XT, including DOS 2.0 and the fixed disk.

Rosch also states that the program "doesn't tell you what you did wrong." This may be true in a few instances, but for the most part, the user is told why his or her response is right or wrong. For each question in a Cdx training program, we normally have up to nine screens containing hints and incorrect and correct responses. In other words, the program does have answer-judging capability.

Apparently one of the disks Rosch re-

ceived was defective. If he had called us we would have been happy to replace it. As a matter of policy, we offer full replacement on all defective disks within 90 days of purchase.

John Noon
Manager, Product Development
Cdx Corporation

Winn Rosch replies:

Noon apparently missed my point about including a lesson on how to load a diskette on a training diskette. If the disk is running, somehow the user managed to figure out what it was, how to put it in the computer, and how to get it operating. If someone has already performed that task, why bother telling him how to do it again? I did mention, later in the article, that instructions for getting the lessons up and running are included in the manual.

I mentioned that the program will not run on an XT primarily as a warning for XT owners. At the time that I wrote the review, an XT version was not, to my knowledge, available.

Perhaps I missed the "up to nine screens of hints and correct and incorrect responses" because I didn't make the right mistakes.

A Weighty Problem Solved

I have read with interest the many letters from PC readers concerning the size and weight of PC Magazine. The latest issues weigh in at about 3 pounds, and it seems that the magazine will continue to grow.

The size of the magazine has led to the problem of storing copies—an issue that is getting, quite literally, out of hand. I originally stacked my issues side by side, but the larger issues have begun to fold and bend. So I tried having my 7-year-old son Ian hold the PCs in place while standing at attention, but he eventually started to bend and lean too, under the weight of the magazines.

Next I tried placing the volumes one on top of the other, but that resulted in a weight-lifting problem; it always seems that the issue I want is at the very bottom of the stack.

Here, then, is my solution. The individual volumes of PC can be placed between books on a bookshelf, spaced at intervals of two or more books. When you pull out one PC, the entire row of books and magazines won't fall over like dominoes.

My wife, Diana, has one suggestion for PC storage: "If all else fails," she says, "then throw 'em in a box."

Bil. Alvernaz
Sante Barbare, California

Enough, enough! Read "From the Editor's Screen" on page 39 for the on-noumment to our readers cleverly hidden at the end of the column.—Ed.

Fixing Multiplan

In "Letters to PC" in the July issue, one of your readers noted that he was unable to load Multiplan onto a fixed disk ("In All Fairness . . .," PC, Volume 2 Number 2). I am sure your readers will be interested to learn that IBM has recently issued a utility diskette that enables Multiplan to be placed on a fixed disk.

Owners of IBM Personal Computer Multiplan may obtain a copy and a backup copy of the utility diskette from an authorized IBM PC dealer.

Jeannette Maher
IBM
Boca Raton, Florida

Mail Order Marvel

I recently answered an ad in PC for a product called Textura, a word processing program offered by a company called Ann Arbor Software Associates. The program sounded as if it would suit my needs, so I called the company and ordered a copy. I was promised that it

would be shipped by Federal Express the next day.

A week passed, and no Textura. When I called Ann Arbor Software, a secretary listened to my complaint and said she would find out what had happened.

Within 10 minutes, news of my lost order had reached the higher-ups, and I received a phone call. I was assured that the company was very embarrassed to be starting off on the wrong foot with a new customer. The program would be shipped to me via "next day" air service, at the company's expense. I was speechless.

The software was in my computer and working in less than 40 hours. There are some mail-order firms that do back up their promises, despite the horror stories that have circulated.

Robert Hafernik
Houston, Texas

PC Goes Continental

I have been reading through PC with much interest and have found the list of user groups. Do you have addresses for PC user groups in Europe, particularly Switzerland?

Jacob Ruegg
Zurich, Switzerland

We don't have any information about European user groups, but we'd be delighted to hear from foreign readers who do.—Ed.

Parity is Priceless

Technical Editor Bill Machrone's comment that "the fail-safe approach . . . taken by IBM and other manufacturers is laudable, but unnecessary" is naive, as is his contention that "it's only a stop-gap on the way to full error-correcting memory" ("Eagle Has Its Eye On The PC," PC, Volume 2 Number 3).

A moment's reflection should convince anyone that "full error-correcting

memory" is impossible in a finite machine. The check bits are also subject to error. The best we can hope for is m bit error correction and n bit error detection (where $m < n$). IBM's parity checking is zero bit correction and one bit detection—the simplest possible form.

Machrone writes, "Without parity, the Eagle lets the user find out about memory problems in the usual ways: memory tests, program execution errors, and mangled words in your documents." This assumes only permanent errors or the user's unending ability to recognize invalid output. Perhaps Machrone only uses his PC for word processing; an Eagle may be fine for him.

I'm using my IBM PC to construct an intelligence-amplifier for oncologists treating multiple myeloma (terminal cancer of the bone marrow). A false negative trend in computer cancer growth at a given level of chemotherapy could lead to an untimely death. Other PC users might "only" lose their business—a high price for the few dollars saved by omitting parity.

Charles R. Blair, Sr.
Tennessee

Bill Machrone replies: Accountants use double-entry bookkeeping. Skydivers wear two parachutes. Serious computers correct single bit errors and detect double bit errors. They also log soft memory errors for service and correction, not halt. I hope your program or, if you prefer, intelligence amplifier, is at least as redundant as the above examples. I wouldn't recommend an Eagle PC to control machine tools or life support equipment, but neither would I recommend an IBM PC.

Camera Shy

I was very pleased to see images created with Kaleido, our interactive kaleidoscope generator, featured in PC's recent

How FORTH level 2 makes your PC 412% more powerful

What used to take 40 hours can now be done in 7.8 hours — that's 412% — and it is only one way of measuring power. There are others — convenience, debugging ability, run-time, compile-time, memory size . . . name it! FORTH level 2 will increase your power because it provides an interactive, integrated environment which promotes immediate debugging and modular design. Other benefits such as real-time performance depend on the quality of the implementation. Not all FORTHs are equal, so compare before buying. This one is a subset of polyFORTH, designed by FORTH, INC., tested and proven in the field for more than 5 years.

At last it is available at an affordable price of \$149 — and features the following:

■ Multitasking

Any number of background tasks. Concurrent operation of monochrome and color monitor. Concurrent printer operation.

■ Compatibility

IBM DOS file interface utility allows access to files created under IBM DOS with FORTH's improved performance and power.

■ On-Line Documentation

As well as over 100 pages of supporting documentation including *Starting FORTH* by Leo Brodie and 300-page *User's Manual*.

■ Turnkey-compiler™

Utility for making binary turnkey applications. Such programs can be resold without license fee under specific conditions.

Options:

■ 8007 support	\$129
■ Data Base support	\$75
■ Report Writer	\$25
■ Documentor	\$75
■ Multi-User capability	\$129
■ Graphics module	\$100

This is not a complete list and you may have questions not covered in this material — give us a call. We will address them and send you a brochure.

Act now! After all, if this is the right software tool for you, shouldn't you know about it?

Forth Technology

432 15th Street ■ Santa Monica, CA 90402

(213) 372-8493

Letters To PC

test of video cameras ("Points of View: Comparing The Cameras," PC, Volume 2 Number 3).

Since no software credits were given, perhaps some of your readers are curious as to where they can obtain Koleido and/or some of the other software mentioned. Koleido is available exclusively from Once Begun Computations for \$12, postpaid.

M. Gary Cohen

Proprietor, Once Begun Computations
Searsport, Maine

Stunning

Congratulations on a job well done. Karen Cook's "In Search of Computer Training" is a stunning article and reflects much of the same opinion in and around our user circles (PC, Volume 2 Number 3). Equally stunning was the model who posed on the cover and on page 90.

Once again thank you for a most informative article.

Craig R. Foote

Rochester, New York

I Am A Screen Camera

We at Lang Systems applaud Winn Rosch's article "Points of View: Comparing The Cameras." Using 35mm slides for presentation is a logical and cost-effective use of the PC's capabilities.

The following additional points may be of interest to anyone considering the VideoSlide35:

1. When the factory setting (for Eastman Kodak Ektachrome 200) is used, the exposure time is 12-18 seconds.

2. The Lang recommended setting for Ektachrome 64 blue exposure was much too long, as Rosch's tests showed. This has been corrected.

3. An optional adapter back permits use of Polaroid SX-70 film in addition to 35mm.

4. Both the RS-170 and TTL interface boards are available with raster fill. The raster fill control is a potentiometer accessible through the interface board face plate.

5. All three exposure phases (red, green, and blue) may be previewed by pressing the start button with the 35mm camera switched off. This also checks the operation of the color wheel.

6. An NTSC interface for the VideoSlide35 will be available in October. All interfaces are user changeable.

Thanks for a well-done equipment review.

William Cliff

Sales Manager, Graphics Products
Lang Systems, Inc.
Menlo Park, California

Compaq Clicks

In his review of the Compaq computer ("Compaq: Getting There Isn't Half The Fun," PC, Volume 2 Number 1), Corey Sandler bemoans the failure of the documented method for adjusting the loudness of the key clicks. I had the same problem until my research took me into the keyboard routine contained in the Compaq ROM.

There I discovered that the documentation is close to the proper method, but not quite right. You must press the Ctrl and Alt Keys together with the plus (+) key to include the volume, or the minus (-) key to decrease it.

Ken Snapp
SoftTool Systems
Denver, Colorado

Correct Me If I'm Wrong . . .

I was very disappointed to see such a concentration of errors in a single article as in "The Great 5.25-Inch Disk Drive Shortage" by Todd Katz (PC, Volume 2 Number 2). The errors indicated that the author didn't bother to do his research.

For starters, it's the Victor 9000, not

6000. The screen resolution is 600 × 400, not 600 × 300. The floppy drives store 600K at single density and 1.2 megabytes at double density.

Bob Callagher
Northfield, Illinois

Todd Katz replies:

I stand corrected regarding the errors that Gallagher kindly pointed out. To set the record straight, and according to the Victor 9000 operator's reference manual, the screen resolution is actually 400 × 800 pixels in the graphics mode. The floppy disk drives store 600K single-sided and 1.2 megabytes double-sided (not single or double density).

Talk Talk

Stephen Manes' comparison of Free-ware's PC-Talk III and Hayes' Smartcom II was thorough and fair ("Remote Possibilities: The Latest Line On The Heavy-Baud," PC, Volume 2 Number 2).

There is, however, one apparent bug in PC-Talk III of which some terminal program users may want to be aware. In version 830424 of the 128K compiled program, a configuration of 300 bits per second, seven data bits, one stop bit, and no parity will hang (no pun intended) the autodial function. Although the DIALING prompt appears, no dialing takes place.

Changing all parameters except baud and parity made no difference; changing only parity (to odd) solved the problem. If users must use seven data bits with no parity, the keyboard dialing option will work.

According to the on-disk documentation, the program will support no parity if an eight-data-bits configuration is used to transmit a binary file.

That very small problem aside, I feel that PC-Talk III should be the de facto standard for the industry.

Andrew Fluegelman should be com-

mended for this program and for the Freeware concept.

Chris Bagdikian
Bakersfield, California

Taking On Technobabble

Hold the mail bag, Maude. Corey Sandler rattled my cage with his editorial on technical writers ("Documenting An Infinite Number Of Monkeys," PC, Volume 2 Number 3).

Few of us who style ourselves word-smiths would argue with his implied thesis: tech writers, on the average, are a simian lot. After all, most of us emigrated to the profession by imitation; schoolhousing was not a prerequisite for the zoo.

Examples of incompetence abound. Consider the case of a technical productions manager who insisted that his writers produce first-rate instruction manuals without firsthand knowledge of the product. Naturally, publications from his group were light on operating instructions but heavy on procedures for inserting plugs into wall outlets.

If we continue to concentrate on the absurd, though, we do little to close the gap between the writer and the end-user. Instead, let's take a close look at any technical publications department. In most organizations, it reports to engineering or marketing. Even if it's the latter, the department head will generally be an engineer who abandoned the workbench for the amenities of carpet row. Most engineers shun the written word.

Time is also a major factor in our race toward incomprehensibility. Try telling engineers that the average 100 page manual takes three or more months to publish. They cannot comprehend the impossibility of writing, illustrating, editing and printing a 25,000 word document in 2 weeks.

Finally, budgets for technical publica-

An Epson FX Without Set-FX™ is Like a Porsche Without a Key



Your Epson FX printer is a powerful machine. Alas, getting into the driver's seat isn't always easy. Set-FX software lets you and your IBM PC take your FX for a real tour. It's as simple as touching a key and taking off.

With Set-FX, you can now conveniently:

- **Print** those missing IBM characters as they appear on the screen, including block and line graphics, foreign characters, and math & science symbols.
- **Set** print modes to condensed, emphasized, italics, proportional, and 50 more. Control Margins.
- **Create** your own typefaces for logos, forms, and unique styles.
- **Explore** your FX's capabilities with our FX-Ideas program, Instructional Manual, and Quick Reference Card.

Race away with Set-FX... it prints in full-speed text mode!

At last, you get the printer control, IBM character set, custom typefaces, and high-speed printing in one comprehensive package.

For the key to great performance from your Epson FX, ask your dealer or order direct. Price \$59.95

SoftStyle, Inc.
Suite 200, Dept. C11
7192 Kalanianshale Hwy
Honolulu, Hawaii 96825
(808) 396-6368



SoftStyle™

For the IBM PC or COMPAQ with Epson FX-80 or FX-100 DOS 1.1 or 2.0. Works with most word processors and spreadsheets. MC or VISA accepted. Add \$2.00 for handling.

TEKTRONIX 4010 TERMINAL EMULATOR PC-PLOT-III

THE GRAPHICS LINK
BETWEEN THE IBM PC
AND YOUR COMPUTER NETWORK

- Complete Communications Package
- Full 4010 Emulation
- Menu or Command Setup Modes
- Auto Dial, Auto Login
- Save Picture Files on IBM
- Hewlett-Packard 7470A Plotting
- Upload, Download ASCII Files
- Multiple Terminals Emulated
- 4010 Only
- 4010 + ANSI X3.64 (VT-100)
- 4010 + Computer Executive
- Selectable Graphics Boards
- IBM Color/Graphics Board
- 640 x 200 Monochrome
- 320 x 200 4 colors
- Plantronics PC+ Board
- 640 x 200 Monochrome
- 640 x 200 4 colors
- 320 x 200 16 colors
- Hercules Computer Products
- 750 x 350 Monochrome
- NOT Copy Protected, can be used with PC, PC XT, DOS 1.1 or 2.0

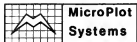
Increase the utility of your IBM Personal Computer by using it as a graphics terminal in your local computer network or dial-up service. PC-PLOT-III will work with Precision Visuals (P-3000), S&S Graph, ISSCO's Display & Tell-A-Graph, Tektronix PLOT-10, Chemical Abstracts On-Line, Questel QARC2, and any other program that generates Tektronix 4010 compatible commands. All Tektronix 4010 commands are implemented including interactive cursor reporting. The color modes utilize the Tektronix 4027 color and palette select commands.

PC-PLOT-III is a field-proven program with hundreds of copies in use every day by major universities and Fortune 500 companies. If you have an IBM Personal Computer, you cannot afford to be without PC-PLOT-III.

PC-PLOT-III requires an IBM-PC, 64k minimum, 1 disk drive, graphics adapter (one of the three specified), and an asynchronous communication adapter which can be either IBM or on a multi-function option card which are available from many vendors.

PC-PLOT-III is available for same-day delivery from MicroPlot Systems and will soon be in stock at leading computer stores across the country. VISA/MasterCard, purchase orders from O&A rated companies, and checks are accepted for payment. We will also ship LPS/COOD. For instant shipment, call Steve Bean at 614-882-4786 with your purchase order or credit card number.

PC-PLOT-III is a bargain at \$95 because you will not have to purchase an additional communications program to gain access to the service. The Source, or other time-share network, PC-PLOT-III is supplied on a single used diskette and includes a comprehensive user's manual with both a tutorial approach for new users plus a technical description of the program and command structures for systems programmers.



1807 Red Fern Dr.
Columbus, Ohio 43229

614-882-4786 Telex EASY LINK 62186/30

Letters To PC

tions departments fall near the poverty level. With all the modern tools at a technical writer's disposal, many are forced to labor under Stone Age conditions. Pencils and paper are for writers, one engineering manager thundered as he vetoed a purchase request for a used manual typewriter. That manager got what he paid for.

Put all these factors together, and it is a wonder anything gets published at all. Until engineering managers learn to recognize, demand, and pay for quality writing, you ain't got no chance, nobow.

Gary C. Gray
Grapevine, Texas

I take exception to A. Scott Earle's recommendation that "literate idiots" with no technical knowledge team up with "techno-genies" to write user manuals ("The Literate Idiot: A Reader's Best Friend," PC, Volume 2 Number 3). I have been a professional writer/analyst in data processing for over 10 years and have authored numerous publications including user's guides and reference manuals. In my opinion, the causes for the poor quality of commercial user documentation are numerous:

1. A reluctance on the part of corporate management to acknowledge the importance of documentation to the success of their product.
2. An insufficient number of experienced, professional technical writers with strong technical backgrounds and good communications skills.
3. Poor project planning.
4. A general lack of understanding on how to present technical information so that it is easily accessible and understandable.

The solution is to leave the job to a professional writer/analyst who understands the technical aspects of systems and how best to present them to the user(s) at hand. This specialist should be an integral part of any development team, not someone brought in at the end

when it's too late.

Mr. Earle's rule would cause an already poor situation to become worse. Instead, consumers who happen to purchase a poorly documented product should return it to the vendor with an explanation—and a demand for a full refund.

Jim Crawford
Documentation Specialist
CENTEC Corporation

Regarding two articles in your August issue: "Why Computer Manuals are Driving Everyone Stark Raving Mad" and "The Literate Idiot: A Reader's Best Friend": HOORAY! We've been saying the same things for 6 years.

Let engineers build the systems and let writers write the manuals. I have nothing against engineers. As a writer, I would never attempt to design the hardware, so why expect engineers to write the manuals?

Francine Schberger
President, Communicat, Inc.
Ann Arbor, Michigan

Corrections

Due to a production error, the "Database-zero" cartoon (PC, Volume 2 Number 4) may have appeared to be part of the advertising package from AST Research, Inc. This was not the case, and we apologize for the error. Further, we apologize to readers who objected to the content of the cartoon. "Databasezero" has been discontinued.

In the same issue, in "Start Spreading the News," the name of IBM's Director of Software Publishing was misspelled. We apologize to Joyce Wrenn.

The price quoted for the Mastergraphics Adapter, \$579, refers only to the board itself and does not include additional options modules as described ("New On The Market," PC, Volume 2 Number 4).

SMALL CARDS WITH BIG FEATURES . . . FROM APSTEK

NEW SIC-1

SERIAL INTERFACE AND CLOCK/CALENDAR

- ASYNC. COMMUNICATIONS PORT
configurable as COM1; or COM2;
selectable interrupt level
- CLOCK/CALENDAR
crystal-controlled accuracy
utility software included

only \$149 each

APSTEK is leading the way with timely new products for IBM Personal Computers. The SIC-1 and PIC-1 have been designed to add most-wanted functions at a low price. Both are fully compatible with IBM Personal Computers and will fit the small slot in the XT.

The SIC-1 and PIC-1 add a clock/calendar to the standard asynchronous communications port and parallel printer port at a cost of only a few dollars more than the ports alone. Our clock/calendar maintains accurate time and date; its lithium battery provides a long lasting reliable power source when system power is off.

All APSTEK products are fully guaranteed 1 year.



APSTEK MULTI-FUNCTION CARD

- Up to 256k Parity-Checked Memory
- Asynchronous Communications Port
- 6 ft. External RS232 cable included
- Parallel Printer Port
- Clock/Calendar
- Software Includes:

Time/Date Set, Electronic Disk,
Print Spooler and Diagnostics



PIC-1

PARALLEL PRINTER PORT AND CLOCK/CALENDAR

- PARALLEL PRINTER PORT
configurable as LPT1; LPT2; or LPT3;
may be used for parallel data input
now includes Print Spooler Software
- CLOCK/CALENDAR
crystal-controlled accuracy
utility software included

SUGGESTED RETAIL PRICING

SIC-1 Serial Interface/Clock	\$149
PIC-1 Parallel Interface/Clock	149

AIM-256 - Multi-Function Card

AIC-256-05 with "0"K	\$299
AIC-256-01 with 64k	369
AIC-256-02 with 128k	439
AIC-256-03 with 192k	509
AIC-256-04 with 256k	579
AIC-256-09 64k upgrade kit	69
AIM-256 - Memory Card	
AIM-256-05 with "0"K	\$199
AIM-256-01 with 64k	269
AIM-256-02 with 128k	339
AIM-256-03 with 192k	409
AIM-256-04 with 256k	479
AIM-256-09 64k upgrade kit	69

APSTEK INC.

DEALER INQUIRIES INVITED - 214/357-5288

2636 Walnut Hill Lane, Suite 335
Dallas, Texas 75229 • 214/357-5288
CIRCLE 123 ON READER SERVICE CARD

MICROPRO® SOFTWARE

Ask these questions now, or you

IF WE EXPAND
OR CHANGE,
WILL OUR
SOFTWARE
GROW
WITH US?

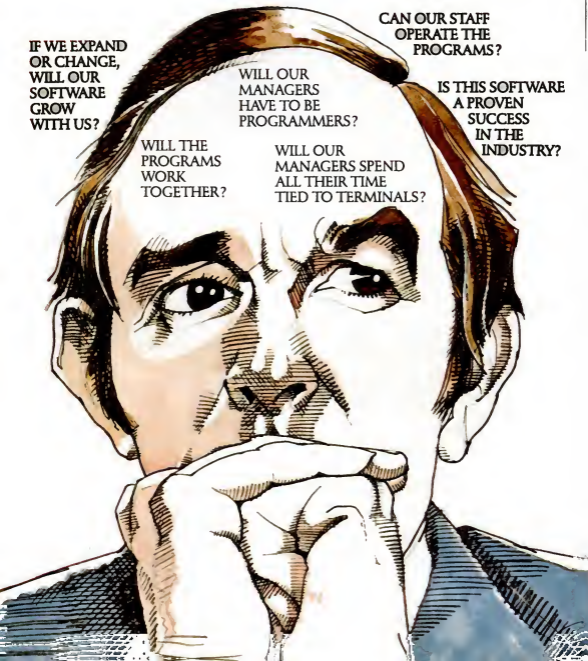
CAN OUR STAFF
OPERATE THE
PROGRAMS?

WILL OUR
MANAGERS
HAVE TO BE
PROGRAMMERS?

IS THIS SOFTWARE
A PROVEN
SUCCESS
IN THE
INDUSTRY?

WILL THE
PROGRAMS
WORK
TOGETHER?

WILL OUR
MANAGERS SPEND
ALL THEIR TIME
TIED TO TERMINALS?



RE BUYER'S GUIDE

will have to answer them later.

MICROPRO HAS THE ANSWERS.

Whatever your current situation, there are factors in the software market that apply to you. Unfortunately, they tend to make choosing software a little intimidating.

For one thing, when you buy software, you're committing yourself and your company to a path, largely governed by the scope and capabilities of a software product line. Even if you're only buying one program now, when you buy more they should all work together. This makes your first decision rather far-reaching. It's expensive and time-consuming to change software; and sometimes requires buying new hardware as well.

MicroPro arms you for any eventuality with the most completely integrated family of business software in the business. Each of our wide selection of programs offers a range of capabilities from the simplest tasks (like memos) to the most complex office automation jobs. Their vast capabilities in Word Processing, "What If" Analysis, Financial Planning, Data Base Management, and more, can be instantly applied to any project; because all MicroPro programs work together. They

share information, operating procedures, and perform complementary business applications.

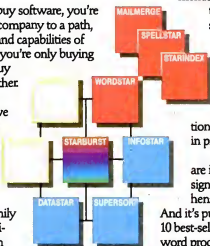
Perhaps the most valuable option of all is the ability to build your own automated systems. With StarBurst[®], a manager can set up simple step-by-step menus to guide staff through delegated tasks. Only MicroPro makes it

simple enough to do yourself so you don't spend all your time doing mundane programming instead of creative managing. And only MicroPro makes it possible for you or another manager to change applications later—without a programmer, in plain English.

Obviously, in business, options are important. That's why we designed the most flexible and comprehensive software system for business.

And it's put our programs among the top 10 best-sellers for years, with WordStar[®], our word processing program, becoming the undisputed standard for the industry.

So don't waste any more time reading about how MicroPro's software answers can pave the way to a more successful future for you and your company. Go to your local computer store, and ask them to show you. For the dealer nearest you call (800) 443-0100 ext. 948.




MicroPro.

*When you start with MicroPro,
there's no stopping you.*

For name of the dealer nearest you, phone (800) 443-0100 ext. 948.
For more information write MicroPro, 33 San Pablo Avenue, San Rafael, CA 94903. (415) 499-1200

CIRCLE 421 ON READER SERVICE CARD



...and one day people will be able to send mail by satellite right from their own homes.

Who would have thought it possible?

Now a new software package makes Western Union mail by satellite services available through your personal computer.

POSTMAN from Sydney is a remarkably simple program to use. Just type your message into the format on the screen and your letter is instantly transmitted by Western Union's satellite and mail network.

Mailgram® messages can arrive overnight anywhere in the U.S., Canada and Puerto Rico. E-Coms® are beamed to a receiv-

ing Post Office for priority delivery. And Computer Letters are an inexpensive Telegram look-alike that arrive with the speed of First Class Mail.

The POSTMAN package costs \$44.95 complete; there are no additional subscription fees. Western Union charges will be billed to a special account or your credit card.*

For more information about POSTMAN, including where to buy it, call 619-231-1775, Extension 50.

POSTMAN. How did we ever live without it?

CIRCLE 718 ON READER SERVICE CARD



POSTMAN FROM SYDNEY. WESTERN UNION MAILGRAMS, COMPUTER LETTERS AND E-COMS® RIGHT FROM YOUR OWN HOME.

Mailgram is a registered trademark of Western Union Telegraph Company. E-Com is a product and a registered trademark of the U.S. Postal Service. *Visa and MasterCard



Fill in the blanks.



**QUADBOARD™
BY QUADRAM™,
NOW AVAILABLE
WITH NO RAM
INSTALLED.**

Quadboard, the world's best-selling multifunction board for the IBM Personal Computer, now boasts a brand new feature—Nothing. No RAM. The perfect amount of memory when your system has all the RAM it needs.

Now you can take advantage of the Quadboard's other enhancement capabilities without paying for unneeded memory or giving up that Quadram Quality. Whether you own a PC, PC II, or PC XT.

Quadboard comes with a parallel port designed to operate most parallel printers and other parallel devices. A fully-programmable serial port for all your data communications needs, and a battery-powered chronograph (a real-time clock/calendar to keep your system's clock always up-to-date).

Plus there's QuadMaster Software, too. With QuadRAM Drive. The program that lets you use part of system memory as multiple RAM drives. Solid-state drives that let you store and retrieve important information fast.

And Qspool. The buffer program that lets you compute while you print. Now you won't ever have to wait on your printer again. And there's also Qswap. The program that lets you change line printers 1 and 2 back and forth. As often as you like. Whenever your printing needs change.

And remember: Quadboard still comes fully-socketed. For memory expansion in 64K increments. So whenever you're ready, simply plug in the desired number of chips for up to 256K additional RAM.

Versatility. Dependability. Quality. Quadboard by Quadram. Still the first and only board your IBM PC, PC II, or PC XT may ever need.

\$295 (Socketed with no RAM installed)
Available at retail computer stores worldwide.



4355 International Blvd./Norcross, Ga. 30093
(404) 923-8866/TWX 810-706-4915 (QUADRAM NCRS)

© Copyright 1983 Quadram Corporation
All rights reserved.

CIRCLE 362 ON READER SERVICE CARD



THIS IS ALL IT TAKES TO RUN OUR HARD DISK.



Compatibility. A lot of manufacturers talk about it. Mostly, compatibility is defined as something that almost works like the original. Our hard disk subsystem for the IBM PC runs on 2.0 without modifications, patches or use of device drivers. Just boot 2.0 and run.

And we haven't cut back on reliability either. The Apparatus hard disk uses the Xebec controller and connects via a host interface module to one of the slots in your PC. The HIM also contains an RS-232 serial async port for use with a

mouse, modem, etc. Even with compatibility and reliability built in, we've managed to provide some very competitive pricing. The 10, 15 and 26 megabyte drives are priced at **\$2,295**, **\$2,695** and **\$3,395** respectively.

When you use a multifunction RAM Card, such as the Apparatus Combo II (with up to 512K of RAM, RS232, parallel printer, clock calendar, and game adapter) along with the HIM, floppy disk controller and CRT monitor adapter cards in your PC, you still have one slot available for future expansion.

If you're considering a fixed disk for your IBM PC, look at all the systems available. Look for compatibility. Look for reliability. Look for value. We think you'll pick ours.

For more information or to order yours call **800/525-7674** or write Apparatus, Inc., 4401 S. Tamarac Parkway, Denver, CO 80237, 303/741-1778. Dealer inquiries invited.

IBM PC is a registered trademark of International Business Machine Corp.
Price and specifications subject to change without notice.



Apparatus, Inc.

CIRCLE 118 ON READER SERVICE CARD

Even your favorite software can have annoying personal habits. Get ProKey.

If you're like most of us you probably own an IBM PC and a closetful of popular software. Maybe Wordstar, Visicalc, dBase II and a few others. And with each program comes its own peculiar protocol, commands and demands.

Suddenly you've become a personal slave to your personal computer.

Free yourself with ProKey™.

ProKey is unlike any other software because it operates just about any other software. So you can spend your time creatively while ProKey takes care of the tedious operational details. Silently, instantly, without errors.

ProKey can print spreadsheet tables, update databases, reformat reports and plot graphics and still leave you time to train for the triathlon or run out for a Danish.

In fact, ProKey can memorize and execute anything you can type.

And no matter how extensive your software collection becomes ProKey controls them all, with one easy to remember protocol.

With all the time you save you'll be able to customize off-the-shelf software to your own personal or business requirements.

Ultimately you'll use ProKey as a "super-command center" operating your own software programs together to create a totally unique, incredibly creative system.

ProKey is available at most Computerland stores and wherever fine software is sold.

Once you use ProKey you'll never curse your cursor again.



RoseSoft, Inc.
4710 University Way, N.E.
Suite 601
Seattle, WA 98105
(206) 524-2350

CIRCLE 418 ON READER SERVICE CARD

To run ProKey, you'll need an IBM Personal Computer or working DOS (any version, including 2.0), and 64K of RAM (Wordstar requires 96K).

Wordstar, Visicalc, and dBase II are trademarks respectively of Micro Pro, VisiCorp and Ashton-Tate.

WordPerfect

"Congratulations on such an outstanding word processing software package! We, at Texaco, are really enjoying using your remarkable software system."

Richard W. Horchler, Computer Center Manager, Texaco

"Your system is light years ahead of any other word processor that we have tested."

Douglas L. Mayor, DL Mayor Corp.

"If you're a new PC owner who's scouting around for a top-of-the-line program, check this one out."

Lindsay Van Gelder, PC Magazine

"My favorite word processor."

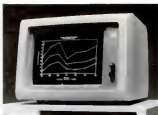
Will Fastie, Creative Computing



SSI

SATELLITE SOFTWARE INTERNATIONAL

TOLL FREE (800) 321-5906 TELEX 453-168 (801) 224-8554
AVAILABLE ON IBM PC, AND MANY OTHER MS-DOS COMPUTERS.
CIRCLE 719 ON READER SERVICE CARD



Getting **1-2-3**[™] to do
graphics on an
IBM[®] Monochrome
takes a lot...

Exactly one Hercules Graphics Card.[™]

What a lot of people have learned the hard way is that you can't run 1-2-3's graphics on the IBM PC monochrome display. That is, until now.

Now, with the Hercules Graphics Card, you can run 1-2-3's graphics on the monochrome display. (Of course, 1-2-3's spreadsheet and information management functions work too.)

But naturally the Hercules Graphics Card does a lot more than just make a great program like 1-2-3 better. It gives you high

resolution bit mapped graphics on the monochrome display—something the IBM monochrome card simply can't do.

The Hercules Graphics Card replaces IBM's monochrome card giving you text compatibility or two pages of graphics, each with a resolution of 720h x 348v. You'll get the monochrome's high quality character set, software compatibility with programs like VisiCalc,[®] WordStar[®] and dBase II,[™] and a printer interface for any parallel port printer.

Included with each Hercules Graphics Card is software that enables you to use the PC's BASIC graphics commands. Or you can program in other languages and use Graph X,[™] our set of assembly language graphics subroutines. (Graph X is available now for only \$50 and includes a graphics screen dump.)

The Hercules Graphics Card. Only \$499. A small price to pay for graphics on the monochrome display. Call or write for the name of the dealer nearest you.

Hercules Computer Technology
2550 9th St., Suite 210
Berkeley, CA 94710
(415) 540-6000

© 1983 Hercules Computer Technology



Graphics software requiring the IBM Color Graphics Adapter is not compatible with the Hercules Graphics Card. Hercules compatible software from other vendors includes programs for business graphics, CAD, and word processing with

scientific characters. Call or write for more information.

Hercules Graphics Card and Graph X are trademarks of Hercules Computer Technology. 1-2-3 is a trademark of Lotus.

Development. IBM is a registered trademark of IBM. VisiCalc is a registered trademark of VisiCorp. WordStar is a registered trademark of MicroPro. dBase II is a trademark of Ashton-Tate.

CIRCLE 261 ON READER SERVICE CARD

RENT SOFTWARE BEFORE YOU BUY!

from our SOFTWARE RENTAL LIBRARY

You can now RENT the most popular software available for just
20-25%* of Manufacturers' Retail Price

- Eliminate the risk—rent first!
- 100% of rental fee applies toward purchase
- All purchases are 20% Off of Manufacturer's Suggested List
- Rentals are for 7-days (plus 3 days grace for return shipping)

SPECIAL INTRODUCTORY OFFER

There are now 2 different plans to choose from:

Join the **Game Group**, \$25.00 per year and rent as many games as you like for only 20-25% of Mfrs. Sugg. Retail Price.*

Minimum order, 3 game rentals

Join the **Business Group**, \$50.00 per year and rent as many business application programs as you like for only 20-25% of Mfrs. Sugg. Retail Price.*

REMEMBER, THESE ARE NOT DEMOS, BUT ORIGINAL UNRESTRICTED SOFTWARE PROGRAMS

(complete with manuals in original manufacturers' packages)

To Immediately Order, or for more information:

UNITED COMPUTER CORP.
Software Rental Library
Culver City, California

Toll Free CALL 1-800 992-7777

In California CALL 1-800 992-8888

In L.A. County CALL 1-213 823-4400

Canadian Orders Welcome



*Plus postage and handling

☐ EDUCATIONAL ☐ ACCOUNTS RECEIVABLE ☐ WORD PROCESSORS ☐ DATA BASES ☐ LANGUAGES ☐ GRAPHICS ☐

PC-Communiqués

A compendium of facts, news, opinions, gossip, and speculation, and forecasts about IBM Personal Computers. intelligence

Debate Over Software Numbering Schemes

The lack of standards in the microcomputing industry has plagued manufacturers, retailers, and users. Now, however, a standard computer Software Number Subcommittee of the American National Standards Committee (ANSC) Z39 (which oversees standards for the library, information science, and publishing fields) is struggling to devise a standardized method for identifying and codifying software. This subcommittee expects to issue its final recommendations by the end of 1983.

The 14-member committee includes book publishers, software manufacturers, and industry trade-group spokesmen. There's also a representative from R.R. Bowker, the United States administrator of International Standard Book Number (ISBN) product codes. ISBN codes, used almost universally in the book publishing industry, convey such information as a book's country of origin and its publisher.

The charge of the subcommittee is to design a standard numbering system for software developed for mainframe, mini-, and microcomputers.

Sandra Paul, chairperson-elect of the ANSC Z39, said, "The industry itself is diverse, ranging from large publishers to small entrepreneurs, and the software products sold must be identified, not only by publisher, but also, possibly, by language, minimum hardware configuration, operating system, and edition."

According to Emory Koltsay, R.R. Bowker's ISBN representative, his company has



already begun issuing prefixes for software and expects to continue doing so. Implementing its existing system, he argues, will save bookstores that sell software millions of dollars.

Michael Fraser, of Peachtree Software, argues that the ISBN system may be too simple for use with software. "Software packages aren't books," Fraser advocates "a system that would allow a retailer to look up a given numerical category in a book and see what products fall

into it." He admits, however, that Peachtree's in-house numbering system, which assigns a 17-digit code to each package, may be too complex.

The Elsevier Science Book Publishing Company and Video In Chicago also publish numerical listings for software. SoftwareLand, a newly incorporated software retailer, is encouraging software vendors to use Uniform Product Code (UPC) symbols—the bar codes seen in

PC Combatible

When a "Parity Error 1" message tells you that everything in your PC's memory has suddenly gone away to Data Heaven, what's your instinctive response? Logically enough, you want to punch the system's lights out.

While this action might bring immediate gratification, it could have expensive consequences. A safer way to transmit your "Basic Aggressive Units of Dissatisfaction" (or BAUD), at any rate, is now available. The Byte Bat is a 17-inch-long, foam rubber baseball bat dedicated to providing a harmless means of hitting computers and terminals. The Byte Bat is compatible with all computers and operating systems—including the IBM PC.

This frustration abate device, along with warning stickers reading "This computer-friendly liveware is protected by Byte Bat," is available from MicroTie Systems Corporation for \$12.50 postpaid by calling (800) 227-3900 or (800) 632-2122 in California.

—James Langdell

grocery stores.

Another participant in the software identification scramble is the Technique Learning Corporation. Its president, David Cohen, sees no conflict in his chairing the ANSC's software numbering subcommittee, nor in his company's announcement of yet another "software market identifier." "The majority of software catalogers and many large software vendors agree that they will accept whatever standards the subcommittee decides to adopt."

In the meantime, software number systems, like software packages, will continue to proliferate.

PC-Communiqués



If U Cn Tnsmt Ths Msg, U Cn Gt A Gd Jb

This year, the General Electric Information Services Company inaugurated a system that was supposed to circumvent some hassles in the job-seeking process. GE's Space Systems Division wanted applicants with experience in engineering and programming disciplines. To find them, the division placed a help wanted ad in *The Washington Post* on June 19 that instructed applicants to transmit their resumes through personal computers to the division's headquarters in Valley Forge, Pennsylvania, where the resumes were automatically stored in a personnel database. GE's recruiters can, quite literally, screen an applicant's resume and print it out if it seems promising.

Eventually, GE plans to implement a two-way bulletin board service that will enable job seekers to call up lists of available positions with their home computers. According to GE, the system will allow talented professionals to "quickly plug into the employment mainstream."

The only trouble is, although the resume data flowed rapidly into GE's computer, the employment mainstream proved to be as sluggish as ever. A GE spokesperson said the quality of applicants who responded to the initial ad was very high, but, 3 months later, the company was still in the process of choosing an employee from its electronic file.

A second ad soliciting resumes via computer won't appear until the first position has been filled. It appears that the job-seeking process is still slow, even in this modern age.

—Karen Cook

The People's Peanut

At last we've learned what the long-awaited IBM Peanut is really like. We were surprised that the computer had no keyboard; IBM made this design decision after seeing a survey showing that more homes had telephones than typewriters. Therefore, the input device is a ten-hole rotary dial linked to a mouse with three buttons that let you select between, say, the letters J, K, L, and the number 5.

Output appears on an Elch-a-Sketch controlled by two mini-robot arms. There's also a small plasma display dedicated to presenting continuous readings of time and temperature. One application suggested in the four-color documentation (which features Garfield) is to place the computer in the oven to signal when a lasagna is thoroughly cooked. Among the bundled software is the CrossWord Processor and Parallel Parking Simulator.

The chassis includes six external slots, providing compatibility with all major videogame cartridges. The Peanut has a built-in modem that telecommunicates over CB channels exclusively, in its search for a suitable

spokesperson for the new computer, IBM negotiated with the Planters Corporation to have the rights to use Mr. Peanut in its advertising. By now you've seen the TV spots with the Little Tramp and the Gentleman Goober dancing side by side in a double-precision hat-and-cane routine.

You might have had some difficulty if you've tried shopping for the IBM Peanut. That's because it's not available in stores. Instead, place your orders by dialing an 800-number, revealed through scenes of late-night movies on television.

IBM has succeeded in creating a true "people's computer." —James Langdell

IBM Softens Up

IBM has found some new homes for its pastel boxes of personal computer software. Software Centres International's stores, located in 18 states, are now authorized to sell IBM's line of programs. This is the first time that IBM has approved a software-only retailer to sell its range of over 50 software packages.

**BRINGING COMPUTERS
into the home won't change either one,
but may revitalize the corner saloon.**

—Alan Perlia
from "Computer Epigrams"

Adam, I'm Adam

Coleco recently settled its differences with Logical Business Machine Corporation over which company has the right to use the name Adam on computer hardware, but its battle may not be over on the software front. The C-4 Computer Company of Champaign, Illinois (its logo stands for "Christ, covenant, community, and change") is advertising a line of religious software. It's named after—*you*



guessed it—Human Being Numero Uno.

"We have a lot of reasons for selecting the name Adam as our trademark for computer software," a C-4 brochure explains. "The name has strong Biblical roots; it reflects a concern for ALL humankind; it's related to 'beginnings' and we are producing brand new materials for a new medium with exciting possibilities. BUT there is another reason: Adam is also the name of Marty Siegel's son." Marty Siegel, it turns out, is Director of Educational Software Design at C-4.

Against these paternal prerogatives, we speculate that, in any potential litigation, Coleco might claim Adam as a direct evolutionary descendant of its Donkey Kong. We'll watch this story closely—and so, no doubt, will the fella or gal upstairs.

—Stephen Manes

Return of the Book

Peter A McWilliams sent us a copy of the third edition of *The Personal Computer Book*, one of his best-selling, self-published guides. The following note was enclosed:

"If you've already read it, or if you've declared a moratorium on computer books (which I myself am about to do), you can take this book to any bookstore and trade it for a real book. Maybe something by Barbara Cartland or Louis L'Amour." Our choice was Graham Greene.

If you aren't tired of seeing computer books yet, McWilliams' new volume, *The Personal Computer in Business Book*, should be a welcome sight—for the sake of its berserk illustrations, at least.



A Zork Fan Turns Pro

Have you played *Zork*, *Swordcoats*, *Witness*, or another of Infocom's adventure games, and reached a point where you couldn't figure out your next move? For the last 2 years help has been available from the Zork Users Group, which created booklets of "InvisiClues" printed in invisible ink so players could retion out secrets one at a time. (See "In Search Of The Exotic," PC, Volume 2 Number 2.)

In addition to providing the hint service, the Zork Users Group produced maps, posters, T-shirts, buttons, and bumper stickers in support of Infocom's games, along with a newsletter titled *The New Zork Times*. There was so much demand for the group's products that its founder (known then only as "Mike") enlisted his parents, friends, and neighbors—none of them Zork players—to help service the adventure fanatics.

The Zork Users Group was so successful that it no longer exists. On completing his MBA degree this year, Michael R. Dornbrook was hired by Infocom as product manager for its entertainment software. To avoid a conflict of interest, "Mike" folded the Zork Users Group.

In the future, Infocom will produce maps and hint books for its own games. All of the user group's InvisiClue volumes have been rewritten. Infocom now makes a practice of creating maps and sets of clues at the same time its games are authored. The clues should be available as soon as new games are released, but the booklets won't be packaged with the software. Dornbrook said that many adventure players don't want to be too easily tempted by the hints.

The late Zork Users Group's buttons and bumper stickers might now be collector's items, but the new InvisiClues can be ordered from Infocom, Inc., P.O. Box 855, Garden City, NY 11530.

—James Langdell

PC-Communiqués

C-MU's CPUs

By 1986, Pittsburgh's Carnegie-Mellon University will require every student in every academic major to buy a personal computer, specially tailored for the school by IBM [see "IBM PC: BMOC" in PC, Volume 2 Number 3]. Computers are already heavily used in C-MU's business and technical courses, but they're starting to be integrated into the fine arts and humanities curricula as well.

Aside from griping about the mandatory purchase ("Big Blue is Watching You"), its cost (\$3,000 would buy a lot of stretched canvas or history books), and the suspicion that their departments will adapt computers for useless applications, C-MU's heavily-outnumbered liberal arts students are taking the latest technological onslaught in stride.

One sure sign that the computers have woven themselves into the fabric of campus life is the popularity of computer-oriented T-shirts. One best-seller displays the university's three initials in the style of IBM's eight-bar logo; underneath is a caption that says, "You will buy a computer."

Another shirt features a slovenly undergraduate hacker standing in front of a computer and holding a bottle labeled with the Coke trademark. His motto: "No Hablo Pascal." —Karen Cook

Peanut, Peanut, Who's Got the Peanut?

One premature report of IBM releasing its "Peanut" home computer appeared in the July 25, 1983 issue of *Computer + Software News*. The story asserted that Macy's New York City store would begin stocking the Peanut on September 1.

That day has come and gone without IBM making a dramatic unshelling in the Big Apple. We may have found the source for those rumors that linked Macy's and peanuts in midsummer minds.

On the afternoon of August 21, Macy's staged the "World's Largest Games," which included an attempt to round up the "World's Largest Assembly of Top Dancers" and the following event:

"Macy's Peanut Pool. We've put a few real peanuts in a sea of styrofoam look-alikes and

whoever finds the real ones receives a T-shirt from Pelican Fashion Industries."

If the "real peanuts" referred to here were actual IBMs, this would have been a bottom-of-the-bag way to launch a new computer.

A week later, at PC'83 in San Francisco, an IBM staffer remarked, "Our booth should have been located closer to the refreshment counter." When asked why, he explained, "People keep coming around, asking for snacks."

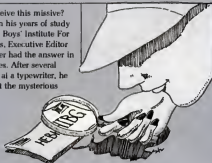
—James Langdell

Encrypted Names

Some puzzling names have appeared in our office recently. First, an envelope arrived, addressed to "HEBBUFER DEHBG." As you might guess, such a name has never appeared on our masthead. So, who was

meant to receive this missive?

Thanks in his years of study at the Herdy Boys' Institute For Cryptanalysis, Executive Editor Corey Sandler had the answer in a few minutes. After several experiments at a typewriter, he deduced that the mysterious



name had been produced with the typist's left hand correctly positioned, while the right hand struck keys one position away from where they should have been. This astute analysis resulted in the enigmatic envelope being safely delivered to Assistant Editor Jennifer de Jong.

Another mysterious name

cropped up in the typed transcription of a taped interview. We wondered why everybody was talking about "Cynthia Matey," until we realized that her name was a phonetic approximation of "CP/M-80." Perhaps Cynthia is a cousin-once-removed of the IBM PC's own Ms. Dos?

—James Langdell

More Than a Box

The cables used to be sold in clay-white boxes. Then Tom Judd of Curtis Manufacturing Company, Inc. had this idea: If his company's extension cables for the PC's keyboard and

monochrome monitor were displayed in clear plastic packages, the visible products could help sell themselves.

Judd investigated, and found it would cost \$14,000 to create the molds to make the plastic

PC-Communiqués Pays

Do you have news, gossip, or unusual computer tales for "PC-Communiqués"? We will pay up to \$50 for each submission used. You must include your name, address, and telephone number with the item. We will preserve your anonymity if you wish. All submissions become the property of PC and are subject to editing. Our "User-to-User" section also publishes and pays for readers' submissions; that section features tips, problem solutions, and short programs or routines. Please send submissions to the appropriate department—"PC-Communiqués" or "User-to-User"—at PC, One Park Ave., New York, NY 10016.

covers. He didn't balk at the expense, but decided that, "If I'm spending that much for these molds, they might as well make something useful."

The result? If you buy a Curtis extension cable, don't throw its wrapping away. Judd designed the package's clear plastic top to do double duty as a snugly fitting dust cover for the IBM PC's keyboard. In an age

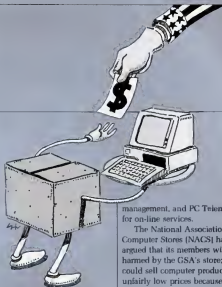
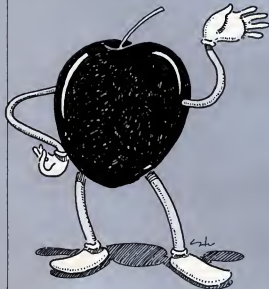
when the wrappers around a hamburger usually outweigh the meat, we like to see some manufacturers think about the future of their disposables.

The Curtis cables themselves aren't shabby either. For more information, contact Curtis Manufacturing Company, Inc., 76 Grove St., Peterborough, NH 03458. (800) 548-4900.

—James Langdell

Plumb Lines

The newest fruit on the computer newsletter tree is a Plumb. The name plays off Apple, of course, but the publication aims to provide a straight line to information and bulletin board services (BBS) that can be reached via microcomputer and modem. In the first issue's eight pages, Plumb offers phone numbers and capsule descriptions of games, hotlines, and employment services, as well as for a Pennsylvania vendor of "electronic erotica," and a "pirate board" that sells tips on beating long-distance phone rates. Plumb's address: P.O. Box 300, Harrods Creek, KY 40027. (502) 228-3820. A \$20 subscription buys all five issues published in 1983.



management, and PC Telemart for on-line services.

The National Association of Computer Stores (NACS) has argued that its members will be harmed by the GSA's store; it could sell computer products at unfairly low prices because the store pays no rent and is guaranteed a subsidy if sales fall below \$100,000 a year. The executive vice president of the NACS, Carroll Groshouse, fears that independent retailers will have little chance to do business with the federal government if the GSA's operation goes nationwide. His organization will keep a close watch on the effect of the initial Information Products and Training Center in Washington and may oppose openings in further locations.

Tim Rose, manager of the Information Center, disagrees. He points out that federal agencies are not required to buy from the GSA's store and that "other stores can offer the same prices we do," Rose adds. "It has not been determined that there will be more stores."

Selling computers to Uncle Sam, according to Rose, is much the same as selling them to John Q. Public. There's more paperwork, though, since everything is requisitioned by purchase orders—no one ever sees cash. Happily for Math Box (if not the NACS) the government buys a lot. While initial estimates pegged the Information Center's sales for the first year at \$2.5 million, Rose expects that his stock of purchase orders will add up to sales going far beyond that.

—Karen Cook

The GSA's PC PX Clix

The U.S. government's General Services Administration (GSA) decided to open a computer sales and service outlet exclusively for federal agencies in Washington, D.C. In the future, it may open similar stores in 11 cities across the country. (See "The GSA's D.C. PC PX" in "PC-Communications," PC, Volume 2 Number 3.) In July, the GSA announced that Math Box, a vendor based in Rockville, Maryland, had beaten out six other bidders to operate the government's computer store. A mere month later, Math Box executives cut the ribbon to open an Information Products and Training Center in the GSA's Washington headquarters.

Math Box operates the store, which supplies 13 microcomputer systems, but has subcontracted five other companies to provide specialized services. MAI/Sorbus handles postpurchase maintenance, and Software Centres International stocks the software: these two companies are among the largest in their fields. The other subcontracts are Moore Business Centers for paper and disks, M/A-COM Sigma Data, Inc. for

J-BIRD

Hop into excitement with J-BIRD! As you rush to change the color of your 3-D pyramid of blocks you have to avoid the critters that are out to make a meal of you. You're going to love the exciting sound and animation of J-BIRD. There are magic balls, jumping frogs, frisky cats, coily snakes, and a host of other obstacles out to do you in. SPECIAL FEATURES INCLUDE: Composite and RGB color modes, giving you beautiful colors on any monitor you use; incredible graphics and sound; sound on/off option; two player option; joystick or keyboard operation; joystick calibration; multiple difficulty levels; high scores saved on disk. These features make J-BIRD enjoyable for everyone.

\$36.95



PC-MAN

A fast, personal computer version of the arcade classic. As the game begins you move through a maze, gobbling tiny, white dots to gain points as you go. But you must avoid the micro-monsters who are also moving through the maze seeking a meal at your expense. Don't let them get too close or your only escape will come from gobbling an energizer. This adds points to your score and briefly turns the micro-monsters into harmless ghosts. Make your escape hurriedly and race for your next meal! Contains the same special features as J-BIRD.

\$34.95



PARATROOPER

"You're the only defender left alive... The enemy has closed in, tested your defenses, and is sending in paratroopers to launch a ground assault... Your one remaining rapid-fire, land-to-air cannon must prevent the paratroopers from landing because four successfully landed paratroopers will stage a ground attack—And once the attack has started, it cannot be stopped. Meanwhile, beware of enemy jets with lethal aim, lurking behind the horizon. You are alone and outnumbered. Can you defend your territory?" Paratrooper is an exciting, high resolution game that can be operated by keyboard or joystick. OPTIONS INCLUDE: pause during play; joystick adjustment; sound on/off toggle; and BREAK for new game.

\$29.95



PITS & STONES

This ancient game of skill and cunning has enchanted people all over the world for centuries. Now from the computer science discipline of Artificial Intelligence comes PITMAN, your worthy opponent. After challenging PITMAN you'll be ready to play Pits & Stones with another person. Animation and music (B songs!) add an engaging counterpart of sound and motion to this time-honored game. Pits and Stones appeals on some level to all ages: it's a musical counting game for toddlers, a strategy game for children, and an optimal Artificial Intelligence sparring partner for the office tournament. Exercise every aspect of your PC and your mind at the same time... play Pits & Stones!

\$36.95



To order by mail send check or money order to:
ORION SFTWARE, P.D. Box 248B, Dept.
11B3, Auburn, AL 36831
1-800-821-8088



ORION

*IBM is a registered trademark of International Business Machines.

CIRCLE 349 ON READER SERVICE CARD

Open Games

Holiday Excitement for your IBM® Personal Computer!
Available at Computerland® and other fine PC dealers.



REVEALED: the best-kept secret in software.

JEWEL™ A NAME TO KNOW.

Our company's been largely an unknown quantity on the national scene until now. But watch out, we're making our identity public knowledge, and the word JEWEL™ is bound to spread quickly. Because we happen to have some remarkable products for the computer industry.

JEWEL™ ACCOUNTING SOFTWARE.

Our systems are easily the most powerful, feature-packed accounting programs available for micro computers. An idle boast? Hardly. For years, JEWEL™ systems have been a pleasant surprise to even the most sophisticated users. Reason? They're far and away superior to the nationally-known companies' micro versions of accounting programs that were originated for larger hardware formats. Ours were written *just for micros*.



Accounts Receivable & Billing

Accounts Receivable, Billing, & Inventory Control
Order Entry
Accounts Payable
Payroll
General Ledger, Standard
General Ledger, Complete
Client Write-Up*

Fixed Assets

Manufacturing (Bill of Materials)
Job Costing**
Medical Accounting
Personal Tax Package
Planning & Preparation
Prepares State Returns
Client Billing***

*Includes Payroll, Fixed Assets, & Spread Sheet Interfaces

**Interfaces with Payroll, Accounts Payable, & Accounts Receivable for progress billings

***Add onto Accounts Receivable & Billing for Attorneys, Consultants, Accountants, Architects, Ad Agencies, etc.

FULLY INTEGRATED, FULLY INTERACTIVE.

That's not something we say just to sell our packages.

It's something designed into our basic accounting concept from the very start that makes us different. Our General Ledger is automatically updated by data from Accounts Receivable, Accounts Payable, Payroll, Job Costing, Fixed Assets, etc. Our Client Write-Up interfaces with Fixed Assets, Payroll, and electronic spread sheets. And our Job Costing allows progress billings.

In short, we've got more performance—lots more. And that means much higher efficiency and many more management tools for the business executive. In designing our accounting packages, veteran entrepreneurs guided some of the keenest minds in program writing to meet the needs of growing businesses. After years of proven success and painstaking refining, they'll now be available nearly everywhere.

P.C. SYSTEM
LETTERING
CONTROL

SYMBOL™

SYMBOL™ THE DAWN OF AN ERA.

While JEWEL™ accounting systems are revolutionizing one area, a breakthrough is coming in another. It's SYMBOL™, an amazing system that converts ordinary type into customized graphic art by bending, stretching and altering it to suit just about any whim imaginable. SYMBOL creates exact, sharp-lined configurations of type—outlined, shaded, or solid—and does it automatically after a few simple data entry steps. Dozens of type fonts are available, with more on the way. The implications for charts, plans, signs, reports & presentations are enormous; imagine perfect lettering from fractions of an inch to wall size!

All our software systems are compatible with any MS-DOS version up to 2.0. JEWEL software will be available in multiuser (Ethernet & other networking) as well as Xenix-type formats.

DEALER INQUIRIES INVITED:
JEWEL Business Systems &
SYMBOL™
The Heritage Group
611 Anton Blvd., Suite 220
Costa Mesa, CA 92626
TOLL FREE
1-800-227-3283

MANUFACTURERS REPS:
If you're looking for a strong line of
exciting products, contact our
California office for details about
applying to be a JEWEL
representative.
TOLL FREE
1-800-227-3283

JEWEL is a registered trade mark of
Heritage Holding Inc.

JEWEL Accounting Software - 1983 by
Occupational Computing Company



The Heritage Group
611 Anton Blvd., Suite 220
Costa Mesa, CA 92626
714/662-6999

Copyright 1983

CIRCLE 229 ON READER SERVICE CARD

With an AST Research Multifunction Board, you can realize the full potential of your IBM PC or PC:XT without wasting valuable slot space. By combining your memory and input/output requirements on a single card, you can take advantage of more of the capabilities IBM designed into the PC, while leaving space for future enhancements as they are introduced.

AST Research Multifunction Boards can add the following features to your PC:

- **User Memory from 64K to 512K** — When added to your existing system memory, brings your PC up to its maximum of 640K. This enables you to run larger spreadsheets, create larger in-memory databases, or you can use the additional memory along with the supplied AST SuperPak™ software for print spooling or for simulating floppy drives to increase your PC's throughput.
- **Serial Ports** — By connecting a modem to a serial (async) port, your PC can communicate with other computers over telephone lines. By connecting a serial printer, you can obtain high quality print output. Other serial devices such as a plotter or mouse may also be connected to a serial port. The PC allows for the installation of up to two serial ports.



Number One Add-On Products for IBM PC

Number One Add-On Products for IBM PC



Optional features may be added by the user at any time by installing an AST Research Upgrade Package.

All products come with extensive documentation as well as all necessary adapter cables.

	Serial	Serial	Printer	Game	Bus
MEM/OST	Port 1	Port 2	Port 3	Port 4	Port 5
SixPakPlus	X	X	X	X	X
MegaPlus II	X	X	X	X	X
I/O Plus II	X	X	X	X	X
ComboPlus	X	X	X	X	X
MP Expansion	X				

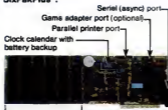
PCnet is a registered trademark of Cirrus Technology, Inc. AST-5251 is a product developed by AST Research, Inc. and Software Systems, Inc. of Jefferson City, MO. AST-3780 is a product developed by AST Research, Inc. and Wilmet Systems, Inc.

AST Research Micro-to-Mainframe Communications Products:

- **AST-SNA** — A family of five products that enable a PC to communicate with a mainframe via the IBM SNA protocol without the use of protocol converters.
- **AST-5251** — An interactive 5251 remote work station emulation package for use with the IBM System 34, 36, or 38.
- **AST-3780** — A hardware/software package which allows an IBM PC to communicate with a mainframe in 2780/3780 bisync protocol.
- **AST-BSC** — A hardware/software package that allows your IBM PC to provide all the features of a 3270 or 2770 terminal in bisync.
- **CC-232** — A programmable card that allows an IBM PC to communicate in async, bisync, SDLC or HDLC protocols.

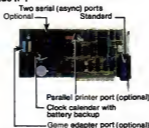


SixPakPlus™:



64K-384K of parity checked memory. Added to a PC or XT with a fully populated 256K system board, the SixPakPlus can bring the system memory to 640K, the maximum addressable user memory.

I/O Plus II™:

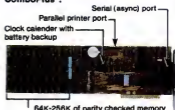


MegaPlus II™:

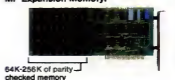


64K-512K of parity checked memory. The basic card expands to 256K, and with the MegaPak extension expands to an additional 128K or 256K of parity checked memory.

ComboPlus™:



MP Expansion Memory:



AST-PCnet™:



- CSMA/CD 1 Mbps baseband Local Area Network
- Uses standard 75-ohm CATV coaxial cable capable of running up to 7,000 feet
- Interconnects multiple PC's (57,000 addressable limit)
- All PC-compatible disk drives and printers are shareable
- Networked access to mainframes via shared AST-3780
- Users can execute commands remotely on shared PC
- File lock-out
- DOS 1.1 and DOS 2.0 compatible

AST
RESEARCH INC.
Irvine, California

(714) 540-1333 • (714) 663-1333
Telex: 295370ASTRUR

CIRCLE 121 ON READER SERVICE CARD



1. Open the foldout page
2. Insert this sheet with
 1. Front side touching the free page
 2. Arrow pointing to the fold
3. Slice the folded edge
4. Close the page and slip-sheet

Foldout slip-sheet



034555sheet-001



Inverted Foldout slip-sheet

1. Open the foldout page
2. Insert this sheet with
 1. Front side touching the free page
 2. Arrow pointing to the fold
3. Slice the folded edge
4. Close the page and slip-sheet



Folded edge of the page

• **Parallel Ports** — The parallel port is used for connecting a parallel printer to your PC. A parallel printer typically uses a dot-matrix output which is suitable for high-speed draft quality printouts. The PC allows for the installation of up to three parallel ports.

• **Clock-Calendar** — With the on board battery, the clock-calendar feature will maintain the correct date and time, even when the PC is turned off. This feature eliminates the need for typing in this information each time you power up your computer.

• **Game Adapter** — The game adapter port allows you to connect an IBM-type joystick to your PC so you can play the multitude of arcade-quality games which take full advantage of the PC's graphic capabilities. Or you

can use the joystick input for other applications by writing your own programs.

• **SuperPak** — Every AST Research Multifunction Board comes with an AST SuperPak diskette containing programs for setting and accessing the clock, as well as SuperDrive™ and SuperSpool™, the most powerful RAM disk and print spooler available for PC-DOS. With SuperDrive you can use your PC's memory for simulating one to four floppy drives, from 20K to 360K each. SuperSpool allows you to set aside memory (from 4K to 512K) as a print buffer. SuperSpool sends output to the printer in the background while you execute your program in the foreground. With SuperDrive and SuperSpool, you can significantly improve your PC's operating speed.

• **Proven Compatibility** — All AST Research hardware and software products are 100% compatible with all versions of the PC and PC-XT as well as the Compaq and other PC look-alikes, and are 100% compatible with PC-DOS 1.1 and 2.0.

• **Warranty** — All AST Research products are backed with a one year limited warranty covering parts and labor with an optional paid second year warranty available.

Of course, all AST Research Multifunction Boards come with the **AST "PLUS,"** our unsurpassed reputation for quality, reliability, after-the-sale support, and overall design excellence which give our products the best price/performance ratio in the industry!



Defining the role of criticism in the personal computer press raises questions that have no right answers. What do readers think?

To Rate, Or Berate?

I wrote an article on some of the problems of DOS 2.0 for the July issue (see PC Magazine "The Dark Side of DOS," Volume 2 Number 2). Some of the repercussions of this article have given rise to an interesting topic: the role of criticism in the personal computer press.

Many of you may feel that there isn't enough criticism in the personal computer press. I sometimes have felt this way, and I've heard many people remark on the tendency of all the magazines in the field to publish raving product reviews, giving the impression that products are nearly flawless. But I don't think that the press is intentionally biased. One reason for raving reviews is that we're all PC enthusiasts. Frankly, I love this little computer, and everyone who writes about it seems to love it, too. Our enthusiasm for the machine spills over into enthusiasm for all the software and hardware that give our PCs the power to do so many wonderful things. Maybe enthusiasm gets in the way of writing a balanced review.

To Praise or To Damn?

The more cynical of you may suggest another reason: The press doesn't want to

offend its advertisers by publishing negative reviews. Although this is possible, my experience leads me to speak for the integrity of the personal computer press. As a freelance writer, I've sent articles and reviews to nearly every magazine out there, and I've never had critical remarks about advertisers censored from an article. As a magazine reader like you, and as a writer, I can assure you that I've never read anything in the press that has led me to believe criticism was being withheld for political reasons. But in any case, critical reviews are few and far between.

Are writers neglecting their responsibility to the public in not writing balanced reviews? This is a question that we all have to mull over, and there isn't a simple answer. Product reviews should offer information and guidance, so the reader can determine whether a product meets his particular needs. The more information a review gives, the more an article tells us about its subject, the better informed we are. Reviews and articles filled with facts and information about features are helpful, but should they take a step further? Should they delve into the realm of subjective criticism, by saying

Pick up a SixPakPlus™ for your IBM® PC.

Introducing ...SixPakPlus,™ the refreshing new 384KB multi-function card! In response to the changing needs of the IBM PC and PC-XT marketplace, AST Research, Inc. is proud to announce the latest addition to our line of multifunction enhancement products, the **SixPakPlus!** This new product is the result of extensive marketing research into the needs of IBM PC users whether they have the original 64K system board, the newer 256K system board, or the PC-XT. The **SixPakPlus** has been engineered to meet these needs at a competitive price while main-

taining AST's high standards for quality and reliability.

The **SixPak**, as we like to call it, could have been named for the six banks of RAM on it. However, we like to think that it was named for the six functions of the card. The features of the **SixPak** include:

1. RAM memory starting at 64K, user-expandable in 64K increments to 384K. This makes the **SixPak** ideal for the PC or PC-XT with a 256K system board; 384K on a **SixPak** added to 256K on the system board yields 640K, the maximum addressable user memory in these systems.
2. One Serial (async) communications port, configurable as either COM1 or COM2, for use with serial printers, modems, a "mouse," and other serial devices. The serial port has on-board jumpers for easy management of the RS-232C lines, simplifying the wiring of cables in many installations.
3. One Parallel (printer) port, configurable as LPT1 or LPT2 (LPT2 or LPT3 when the IBM monochrome card is installed), for use with the IBM/Epson and other compatible printers. The port is compatible with IBM diagnostics.
4. A Clock-Calendar with battery backup, featuring an easily replaceable Lithium battery and a quartz-controlled timebase for a high degree of accuracy.
5. An optional IBM-compatible Game Adapter port, for use with an IBM-type joystick. In conjunction with application programming, this game port may be used for cursor control, in generating graphics or for playing games at the end of your work day!
6. Every **SixPak** comes with an AST SuperPak utility diskette which includes SuperDrive and SuperSpool, the most powerful disk emulator and print spooler software you can get. These programs will greatly enhance the throughput of your PC or PC-XT by emulating disk drive and printer access at RAM speeds rather than the normal slower speed of mechanical devices. SuperPak is the first of such software to be compatible with both DOS 1.1 and DOS 2.0.

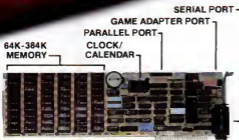
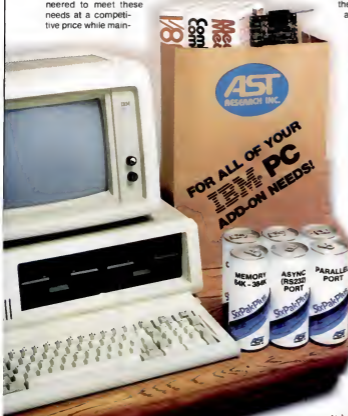
Most important of all, the **SixPak** comes with the AST "Plus," AST's unsurpassed reputation for quality, reliability, after-the-sale support, and overall design excellence that gives our products the best price/performance ratio in the industry! Hence the name, **SixPakPlus!**

AST products are available from ComputerLand, Entre', ComputerMart, and selected dealers worldwide. Call factory if your dealer does not have the AST products you want.

CIRCLE 121 ON READER SERVICE CARD

AST
RESEARCH INC.

2372 Morse Avenue • Irvine, CA 92714
(714) 540-1333 • TWX 295370ASTRUR
Dealer Inquiries Welcome



"This is fantastic, but that stinks?"

If you think about this issue, you can see some of the problems that writers in the personal computer press face. Should we writers suppress our subjective evaluations, and deny readers benefit of an informed opinion, or should we spill our reactions into our writing, and possibly cloud it with limited viewpoints? Every writer faces this dilemma and answers it as best he can. What do you as readers want? What do you expect? What do you identify as your rights? The only way that the personal computer press will be able to define its responsibility to you is if you let it know.

The press has a responsibility to the product manufacturers, too. If we writers attack them for minor flaws in otherwise good products, we can do them a lot of harm. If we ignore their products' defects we rob the market of competitive pressure. What is the press' responsibility to manufacturers in praising and denning their products?

In addition, there is the time-and-version problem. The world of the PC is changing so rapidly that new versions of products constantly are appearing. But the reviewing process takes a surprisingly long time; a product must be received, tested, and evaluated before the review appears in print. If I were reviewing version 1.1 of SuperDuperWare and learned that version 1.2 would replace it by the time my review appeared, how would I treat the flaws in version 1.1? Point out the flaws in 1.1, and mislead readers into thinking that SuperDuperWare was lou-

FRANKLY,
*I love this little
computer, and everyone
who writes about it
seems to love it, too.*

sy? Should I take at face value the manufacturer's claims about improvements in version 1.2 and not mention the flaws, in the hope that they would go away? As a

writer, what is the right thing to do? What do you want as a reader? Which approach would be most fair to the manufacturer?

Big Guys Versus Little Guys

To show how this matter can get complicated, what about the problem of the big guys versus the little guys? You and I know that nothing the press could write would amount to so much as a mosquito bite to IBM. And an unfavorable review couldn't kill a company like Microsoft or Digital Research, either. But a little start-up company, with perhaps one product and only pocket money for capital might be put out of business by a single unfavorable review. Do the little guys deserve gentler treatment? Does their vulnerability call for kid-glove handling? Should products from small companies be held to a lower standard than those from big ones? If my word processor stinks, it doesn't

NOTHING
*the press could write
would amount to so
much as a mosquito bite
to IBM.*

make me any happier that it came from a one-man software house. Should the big guys be given all the criticism they can handle? Should the little guys be given extra room to fix the flaws in their products? Does the size of the producer change the press' responsibility to manufacturers? I find that every time I rephrase this question, my opinion changes—a good sign that there are at least two sides to the issue.

Tone is an important part of the problem of criticism in the press. It matters not only what you say about a product, but how you say it. Consider two cases in point. I once reviewed a software product that I considered to be of shabby quality, much poorer than we deserved; but the product did work, and at the time it was the only one of its kind available. In writing the review, I attempted to be objective

and to show both sides, even though my overall opinion was negative. Later, when I talked to people who read the review, I realized that I'd failed to convey the product's low quality. Apparently, my tone

IF MY WORD
*processor stinks, it
doesn't make me any
happier that it came
from a one-man
software house.*

wasn't harsh enough. So, when I wrote "The Darker Side of DOS," I toughened up; there were problems with DOS, and I wanted to make sure potential users were warned. I wasn't down on DOS—let me reassure you that I use 2.0 60 hours a week, and it suits me fine—but I was appalled by the number of problems I found in a very short amount of time. My concern was twofold. First, if I found that many problems in a few days, how many more might be uncovered later? Second, if a seasoned user like me had troubles, where did that leave the less-experienced? Out of this conviction came the breathless writing style of "The Darker Side of DOS."

But if my former review was too gentle, this one was misleadingly harsh. Lots of people have told me that I savaged DOS in my review; this wasn't my intention. The tone of critical writing, I've learned, must be finely tuned. How strongly should we talk about the good and bad features of any product? Should we be mellow, or melodramatic? Dramatic writing makes for enjoyable reading, but it may mislead the reader. Bland writing might be fair, but it can put readers to sleep. How would you have it?

I don't know the answers to the questions I've raised here; I am still finding my way through the thicket of tangled issues, issues of fairness, issues of responsibility. But I do know one thing: I expect to continue having as much fun writing about the PC as I have using it. /PC

SUCCESS STARTS HERE



The day you bring your first CAI™ learning game home and watch your child play, you'll know the excitement of a winning choice.

Active Family

Your family and CAI's growing family of animated, full-color programs have a lot to share — beginning with a willingness to reach beyond the ordinary to achieve the best.

At Your Command

You may meet a princess, a juggler or a dragon in *Wizard of Words*™. You may appear as a guest on TV in *Master Match*™, *The Game Show*™ or *Tic Tac Show*™. Or, you may extend these programs still further with our *LearningWare*™ diskettes, offering hundreds of questions matched to the teaching strategies in the games. In every case, CAI puts a world of imagination and learning at your fingertips. And puts you and your child in control.

Unique Approach

Key features place CAI thinking tools in a class by themselves: Each program comes with its own *library of subjects*. But that's just the start. Our unique *authoring system* lets you or your child create your own lessons on any topic, tailoring the program to your family's needs — and no computer knowledge is required. Add the fact that we've kept the vital ingredient — *FUN* — in learning, and our *proven success* is no surprise. Over 2,000 school districts now use CAI programs to teach essential vocabulary and logic skills in a variety of subject areas.

CAI supports its products — and you — with an unconditional guarantee and a free backup disk. And provides compatibility with the most popular computers: Apple,® IBM® (and soon Commodore™).

Wise Choice

CAI is a group of experienced educators and programmers who believe that success begins with opportunities you create at home. Ask to see a demonstration of CAI programs at your local computer store, and see for yourself just how rewarding a good education can be.



**Computer
Advanced
Ideas**

Bringing Ideas Home

CAI™
Home

CIRCLE 114 ON READER SERVICE CARD

1442A Walnut Street, Suite 341
Berkeley, CA 94709 (415) 526-9100

Apple is a registered trademark of Apple Computers, Inc. IBM is a registered trademark of IBM Corp. Commodore is a trademark of Commodore Business Machines, Inc.

ABM *presents* THE TALKIES



What Managers Need To Know About Intelligent IBM PC 3270 Communications

We've got just the ticket for DP managers.

Because, ABM Personality Series Intelligent Communication Subsystems allow IBM Personal Computers and XT's to double as full fledged multi-function 3270 communications systems.



You can start with just one IBM PC or XT communicating directly with the host, then add up to twelve more per cluster arrangement. Depending on the ABM software installed, the IBM PC emulates either a 3276 display and control unit or a 3276/3274 cluster controller for 3270 BSC and SNA/SDLC communications.

Better yet, each IBM PC can be used for local computing tasks while maintaining 3270 host communications and performing host generated printing, thanks to ABM's on-board Z80C front-end processor, 64K RAM, and emulation software. While performing these multiple tasks, your personal computer can also be upgraded to act as a 3276 or 3274 cluster controller.

What's more, smooth transitions from BSC to SNA/SDLC and other communications protocols are designed in.

User interfaces for custom 3270 application programs are provided.

A parallel printer port and four serial ports are supplied.

And all configurations are field installable and upgradable by non-technical on-site personnel.

None of the non-intelligent communications adapters with IBM PC resident 3270 emulation software provide the flexibility and capability of ABM's 3270 intelligent communications

subsystems, particularly concurrent local tasking and multiple communications session support on a single personal computer/terminal. Yet the ABM way will probably cost you much, much less.



So, call us today and we will usher you into the talkies.

ABM Computer Systems, 23362 Peralta Drive, Laguna Hills, California, 92653, (714) 859-6531. TWX 292427 ABM UR

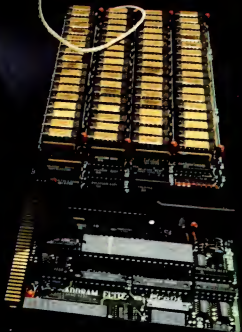


CIRCLE 134 ON READER SERVICE CARD

Buy Our
Software...

FREE

TASC MASTER
Profit Systems, Inc.
© 1983 Profit Systems, Inc.
All rights reserved.



And Make One IBM PC™ Worth Nine

TASCMASTER™ SOFTWARE does that by converting PC-DOS to **CONCURRENT PC-DOS** thus enabling you to create up to 9 tasks and run up to 9 programs simultaneously. **TASCMASTER™ DOES THE WORK OF NINE.** While you are working with a task on the screen other tasks are working for you.

To give you every board you may ever need for your IBM PC we include with **TASCMASTER™ SOFTWARE** a powerful **MULTIFUNCTION board FREE!**

TAKE YOUR CHOICE OF:

ADDRAM ELITE™ FEATURES or **ADDRAM PLUS™ FEATURES**

- asynchronous (Serial-RS232C) communication adapter
 - real time clock/calendar
 - parallel printer adapter
 - 64K to 512K memory with parity "no piggyback" and—all on one board
 - With 64K memory installed
- two asynchronous (Serial-RS232C) communication adapters
 - real time clock/calendar
 - 64K to 512K memory with parity "no piggyback" and—all on one board
 - With 64K memory installed

With **RAMDISK™** and **RAMPOOL™** SOFTWARE, TOO.

Optional **MULTI-TASCMASTER™ SOFTWARE** enables the addition of **MULTI-USER** capability to the IBM PC by connecting additional terminals to the serial ports, and integrates with **TASCMASTER™**. **YOU NEED TASCMASTER™ SOFTWARE** with the free multi-function board to make **ONE IBM PC** worth nine.

Available through personal computer dealers. For further information or name of local dealer call

Profit Systems, Inc.

P.O. Box 1039 • Berkley, MI 48072 • (313) 559-0444

IBM is a trademark of IBM Corporation
(TM) indicates trademark of Profit Systems, Inc.
PC-DOS is a trademark of IBM Corporation
Copyright 1983 Profit Systems, Inc.

CIRCLE 423 ON READER SERVICE CARD

BATTLE NETWORK

NETWORKS/BILL MACHRONE

The manufacturers of networks have been sending up smoke signals to let the world know their products are ready.

While it's often true that where there's smoke there's fire, you can get burned, too.



OF THE K STARS



Are you ready for networking? Here are a few qualifiers that may help you decide. Do you have several PCs and only one letter-quality printer? Do people line up at the printer to wait for their turn? Are there several PC-equipped "stations" through which work must flow? Are you shuffling disks? Is one PC user creating information to be used by others on their machines? Do you wish all your PCs were XTs or had hard disks?

If you answered yes to any of the above questions, read on; you could be a candidate for a network.

We've seen a sudden proliferation of courses purporting to teach you how to network your micros. A course? How tough can it be? For 3 days and anywhere from 500 to 1,000 bucks, you can learn everything from the history of micros to

network topologies to how to negotiate the contract with your chosen vendor. Maybe there's more to this than meets the eye, we figured.

We read the ads, attended the seminars, and dropped by the booths at the shows. Yet through it all, we had nagging doubts about some of the claims being made about performance, capabilities, and price per work station. Our solution was to assemble in our offices one of every kind of network we could lay our hands on. We were tough with the vendors: "If we can't see it work on our machines in our environment, it doesn't exist," we reasoned. The vendors were cooperative. Some sent technicians, some sent marketers, but all sent networks. Our requirements were simple: just tie two PCs to an XT. This, we figured, was the bare minimum configuration we would want as a foundation for a network. When we actually set them up and ran them, we expected the results to be interesting, and we found more than a few surprises.

In order to test the networks, we

devised a group of standard tasks that would be either real-life examples or measurements that would indicate how the networks were likely to perform in real situations. The first thing we wanted to test was how well the network provided shared access to large, commonly used programs. These could be anything from a word processor to a compiler or a spreadsheet program. We chose WordStar as our benchmark for this test and measured the amount of time necessary to load it over the network from a hard disk file server.

Do you wish all your PCs were XTs or had hard disks?

Our next test was to see how fast we could pump out characters from the printer port of a print server and to what extent

activity on the network slowed the printer port. For this, we built an "infinitely fast printer," which acknowledged characters as fast as they were transmitted and counted the number of characters sent in 1-second or 10-second intervals. A short compiled BASIC program LPRINTed a character pattern continually.

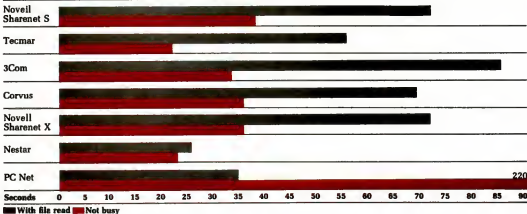
The first of our file-oriented tests was another BASIC program, which continually created files in random access mode. Each record was 1,024 bytes long, and the file length was 20 records. We recorded the time every ten times the file was created. Another test read 20 records at a time from a file of 1K records, and here, too, we checked the time every ten repetitions.

Finally, we combined tests to see what effects they would have on each other. What constitutes reasonable performance in a network? In terms of what a file server can do, it merely needs to be faster than a floppy disk or, if speed is truly immaterial, provide more storage than a floppy disk. Can it live up to its claims? Can it share expensive resources such as fast or

A comparison of the time the networks take to read a file when the networks are not busy and when they are creating a file at the same time.

File Create Time

Network



THE FILE

server looks for all the world like a trash compactor. Inside, however, beats a heart of the purest silicon.

letter-quality printers? Can it keep them printing fast enough to be worthwhile? Speed may well be secondary. Who cares how many megabits per second a network can transfer, if it does things wrong?

AST and Orchid PCnet

PCnet is a single product offered by three vendors. Orchid, Santa Clara Systems, and AST have a technology-sharing and cross-licensing agreement covering

their network products. The network consists of a board, coaxial cable, and software. Each board has a settable 16-bit address, so theoretically a maximum of 65,535 devices could share the network, although more than ten may be optimistic. The stated speed of the network is 1 megabit per second, or approximately 100,000 characters per second. We did not test Santa Clara Systems' version of the network, so we will only describe functional differences where they exist.

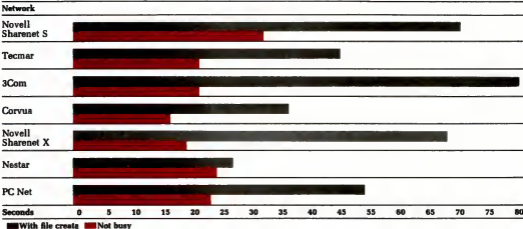
One feature of PCnet is that any PC can be a server or a user. In setting up the system you specify which drives are to be private to the local user and which are to be available on the network. The file server remains usable as a work station. Any station equipped with a printer can be a print server, since each printer is given a network ID, and there is an assignment program that allows you to redirect your print output to any on the network. Security is taken care of at the drive level. If you want to keep a file private, it must be on a non-network drive. There is no real provision

for file sharing, other than having one copy of .COM or .EXE programs available to all users on the network. As with other networks, that means that single-drive or even driveless PCs can be a cost-saving practicality. PCnet provides a convention for locking data files so that they cannot be accessed by multiple users at the same time. This is usually done through batch files, which set a lock flag on a given file while it is in use and relinquish it when the user is finished with it. Since PC-DOS doesn't provide any means of locking or sharing files, PCnet's conventions sit atop PC-DOS—an extra "layer" of checking required before a file can be accessed.

PCnet installed with relative ease on our PCs and XT, after we removed a few cards (a modem, some combo cards, and a non-IBM graphics card), which conflicted with the interrupts used by the AST/Orchid card. WordStar loaded onto a remote PC from the XT in 2.7 seconds with no traffic on the network; the time increased to 6 seconds with our file read and create programs running. The file cre-

Comparing the time it takes the networks to create a file when the networks are not busy and when they are simultaneously reading a file.

File Read Time



ate program took 220 seconds to execute across the network, while the read test took 23 seconds. When we ran them at the same time, the write test went up to 334 seconds, and the read time went to 54 seconds.

Since PCnet modifies the standard DOS running in your PC, it slows down all operations on the machine. For example, a non-networked XT can execute the file create test in a mere 18 seconds. With PCnet running, it increases to 80 seconds, whether or not there is a communications board in the machine. There is a similar effect on the printer. Our printer benchmark, in compiled BASIC, is capable of pumping 840 characters per second out the parallel port. With PCnet running, the speed was immediately cut to 687 cps. The fastest PCnet could send printer-designated characters to another machine was 320 cps—still fast enough to keep most printers more than busy. With the file create running, there was a precipitous drop to an average speed of 80 cps. Adding the write test to the fray cut that speed by half.

A number of findings in our tests indicated that large blocks of writes to disk tend to clog the network, while reads have much less effect. We encountered a major problem in our printer test. Since BASICA and the BASIC compiler were not designed for a multiuser environment, they do things to the network that are, at best, impolite and, at worst, intolerable to the network. Chief among these offenses is the whole printer output scheme. First, BASICA doesn't go through DOS as most other programs do; it has its own printer driver. Second, it not only clears the screen when it begins operation, it also resets the printer. If the printer happens to be a shared device, and it happens to be printing, guess what? It stops. Furthermore, a BASIC program that doesn't print "hogs" the printer, since the reset and the driver make it appear that it is using the printer. Programs with better manners, such as WordStar, merely relay a message from the network control software to the effect: "The printer is busy; try again later."

WordStar and other programs like it

can really be hell on a network system for other reasons. Typically, full-screen word processing programs continually ask DOS whether you are pressing a key. If the machine on which you are running such a program is being interrupted by a network program, you undoubtedly will notice a

IT WAS
*pretty amazing to see
this kind of performance
over two rather
ordinary pieces of wire.*

deterioration in performance.

AST and Orchid recommend use of AST's SuperSpool and SuperDrive spooler and RAM disk software in conjunction with PCnet. While these programs speed things up and lessen printer contention, they make the network a bit more "fragile" and more confusing to set up and operate. In addition to reel drives, you also have the option of sharing RAM drives, and you have to remember which is which, especially if you are sharing memory between multiple RAM disks and spoolers. Typical of all the networks in our test, network drives are assigned over and above whatever you have defined in a local machine. So on a normal PC, if you have only the two floppies, the first network drive will be C: On an XT, however, the very same drive is likely to be D:. If you have defined one or more RAM drives on the machine, the first network drive goes further in the alphabet.

Santa Clara Systems offers a Network Cache unit for use with PCnet. It consists of a small expansion chassis, which sits above or below a file server PC and contains from a quarter megabyte to a megabyte of error-correcting memory. It buffers disk accesses, which, according to the manufacturer, increases the speed of some operations by a factor of 10. The error-

correcting memory reportedly scans the entire memory several times per hour, checking for and fixing soft memory errors, without interference with normal operations.

A side effect of PCnet's design is that it's hard to get anything done on the server if others are using the disk. The server's network board, of course, interrupts the server's program every time something comes across the network. Given the time it takes to fulfill the response and get back to the task at hand, things slow to a crawl. This phenomenon is virtually unavoidable in collision-detecting networks and raises questions regarding the validity of a file server (at least one as slow as a PC) also running application programs. Santa Clara Systems' Network Cache option would lessen this problem, since accessing data in the buffers would be far less taxing on the file server than a full disk access. Along these lines, AST recommends that programs using overlays be copied down to the user station in their entirety to maximize performance. This presupposes sufficient memory in the local machine to hold it in a RAM disk. The combination of write time and potential lack of room on a floppy makes this alternative unacceptable, and it violates the purpose and spirit of networks.

AST has a new electronic mail package in the works, which was not available when we tested the network. Also, both AST and Santa Clara Systems are working on a multi document spooling program, which will be ready by the end of the year. This should eliminate any bottlenecks associated with the printer, but we don't know how it will address the reset problem while in BASIC.

PCnet has one nice, rather unique feature: the ability to run jobs remotely from another PC on the network. While such a function may have limited use, it has been developed to such an extent that the slave PC sends a signal over the network when the task you assigned it is complete.

Nestar PLAN 4000

Nestar's network system is noticeably different from virtually every other system

we tested. The heart of the system is the file server. In its sober gray vertical cabinet, it looks for all the world like a trash compactor. Inside, however, beats a heart of the purest silicon. A 68000 with 256K of memory takes care of network administration tasks, while a 60-megabyte Priam drive (the smallest available; you can go over 500 megabytes) stores your files. Topping it off is a cartridge tape drive that backs up the hard disk in 20 or 45 megabyte increments. PLAN 4000 permits as many as 255 PCs to be connected to a file server, either directly or through a concentrator. The network speed is stated at 2.5 megabits per second. Nestar's network is of the token-passing variety, meaning that each device gets its chance to speak in turn, without interruption.

Our first test yielded a 2.6-second load time for WordStar when the network was quiet, and which rose to 4.2 seconds when the file create and read tests were running. We added a third PC to the fray and had three copies of the file create program running at the same time. This only slowed WordStar to 5.0 seconds. The file create time was a quick 24 seconds, which increased to only 26 seconds when the read test was running. The read test took only 24 seconds by itself and 25 seconds while the create was running.

The speaker on the PC "ticks" to indicate that communication is occurring between your PC and the file server; so, even in lengthy data transfers, you know that something is happening. A unique feature of Nestar's system is that it is not limited to PCs. It supports a large variety of microcomputer operating systems, including Apple II DOS, Apple SOS, CP/M, and others. Thus, many different kinds of machines can utilize the file server and share system resources. The print server software for the PC was in beta test at the time of our trial, so we didn't get a chance to wring it out. There is a fully developed print server for Apple, and the PC system will work the same way. Our impression of the Nestar is one of quality—albeit expensive—workmanship and high performance. The degradation curve appears to be rather low, meaning that this server

can tolerate heavy activity from many users without becoming objectionably slow.

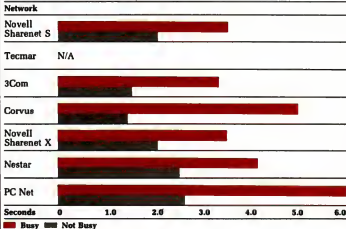
Features abound on the file server. It requires a terminal for operation and needs to be brought up and shut down each day. Operation of the server requires a bit of training and expertise, as there are commands to monitor the file system, backup files, create users, set read/write permissions, and a host of other features. File protection and sharing provisions are good, and there is a sophisticated electronic mail program. Any machine in the network can use electronic mail, regardless of its make, providing a vehicle for interbrand data transfers. Another neat feature is that the PLAN 4000 can act as a gateway to mainframe systems by installing the optional 3270 communications device in the file server. The documentation is in two thick volumes, one for the server and one for the user stations.

Corvus Omninet

Corvus is the grand old man of this test, claiming to be the largest networking company in the world, based on the number of user stations running under their software. We believe them. They were on the scene early with a file server that could tie Apples or S-100 machines together over a ribbon cable to a host hard disk. They also came up with an innovative backup system for hard disks known as the Mirror, which uses a videotape recorder as the storage medium. Today, they use twisted pair cable for the network, unlike all the others we tested. Still, it pumps 800,000 hits per second across the line and uses a collision detection scheme to keep everyone communicating. Just to be sure that we got the point, Corvus sent us 1,000 feet of twisted pair cable, four IBM interfacer boards, and a bunch of network connectors (or taps). Installing a Corvus network entails cutting and stripping the cable and

A comparison of load times for WordStar when the networks are busy and are not busy.

WordStar Load Time



Inserting the wires into the tap boxes. You then plug each PC into a tap box. Corvus' manual says they even supply a wire stripper, but we didn't receive one. The Corvus cable looked less substantial than the co-ax, but it was just as effective. The only drawback we were able to detect was radio frequency emission from the cable. It was weak but clearly detectable on our oscilloscope and could be heard in a radio if placed near the cable. The co-ax, of course, showed no such effect. If we were installing a Corvus network, we would prefer to use a more expensive shielded cable, despite the weakness of the radiation. The shields would have to be connected together in the tap boxes, but we think it would be worth the extra effort. Actually, though, it was pretty amazing to see this kind of performance over two rather ordinary pieces of wire.

Corvus' file-locking technique is similar to PCnet's. There is a semaphore, or

flag table, maintained by the file server, and the Corvus-modified BIOS consults it before opening files for read or write. You can set up a read/write permission scheme on a per-drive basis.

Corvus' spooling technique is a bit different from that of the other systems. There is a reserved spool area on disk end a utility program sets up "pipes" to steer printer output or files to the spool area. It stays there indefinitely, until you invoke the despooling program from one of the user PCs on the network. You can specify which queue or pipe to read from, and it is then redirected over the network to the printer on your PC. Alternatively, you can start the despooler and it will wait patiently for files to show up in the print pipe, printing them as they arrive. This makes a PC a dedicated print station, but you can easily interrupt the despooler at any point, use the PC for other tasks, and return it to printing when you are done. Individual

PCs can, of course, print locally without spooling the output. An interesting feature of the spooler is that it uses compression techniques to reduce the size of the files in the spool pipe.

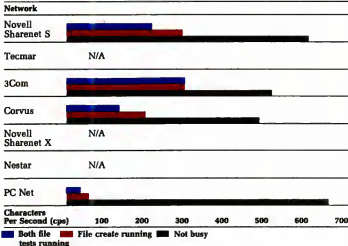
There is an optional electronic mail system produced by a third party vendor

3COM's
software provides nifty
page divider sheets
separating one user's
output from another.

for use on the Corvus network. While we didn't have the chance to write it out in our test, we understand that it is a competent package and will be the basis of PCnet's electronic mail system as well.

A comparison of the speed of printer outputs (characters per second) when the networks are not busy, when they are creating a file and when they have both file tests running.

Printer Output



3Com EtherSeries

The only true Ethernet system in our test is 3Com's EtherSeries. 3Com is the Ethernet company. Yes, Xerox has the name and the patents, but 3Com has all the big guys who developed it at Xerox. In addition to a host of products that cover Ethernet applications from mainframes down to pieces of cable, it offers PC-oriented systems in two flavors: one that uses a PC-XT as a dedicated file server and one that uses an Altos 586 as the server. We chose the latter for our test.

The Altos 586 taken by itself is an impressive machine. In its normal guise it is a five-user system with an 8086 running at 10 MHz, half a megabyte of memory, 10 or 30 megs of hard disk, Xenix operating system, and it's fast. 3Com's version is set up as a dedicated file and print server, with the Ethernet drivers, electronic mail, file system, and print spooler all running as tasks under Xenix. For file integrity and security reasons, no users other than the monitor terminal and the Ethernet tap are permitted on the 586. While the software

is capable of handling 100 users, the reasonable number is probably somewhere between 10 and 40, based on the mix of tasks. We tested the 10-megabyte version of the Altos. The 30-megabyte version's hard disk is about twice as fast. You wouldn't see all that much difference in maximum throughput, but the degradation curve would necessarily be lower in the server with the faster drive.

Having a system with real Ethernet rather than an Ethernet-like protocol has important implications. You can hook it up to anything that is supported by Ethernet communications. This means larger computers or entire computer networks, plotters, laser printers, word processors—the works. That's not to say that you plug in a piece of coax, and all is bliss. You still have to consider protocols, passwords, and compatibility, but the potential is there.

3Com's print server is different from the others. Print spooling and output are done from the file server, the Altos 586, in a minicomputer-like manner. It provides a serial port to drive the printer at rates up to 9600 baud. A potential drawback if you already have an investment in PC-compatible printers is that you can't hook them up to the file server, since they use a parallel interface. Your only recourse is to get a serial to parallel protocol converter.

The operation of the spooler, interface considerations aside, is quite good. Its overall speed drops slightly as the network becomes busy but stays about the same from that point on. It is similar in many ways to the performance of the Altos when running straight Xenix in multiuser mode. As you can see from the chart, the maximum speed we got over a 10-second interval was 540 characters per second; these actually are bursts at the full 9600-baud rate. That's more than enough to keep all but the fastest printers going full tilt. Ditto for the 320 cps throughput rate when the network was loaded. 3Com's software also provides nifty page divider sheets separating one user's output from another—very professional.

3Com is working with a number of software companies on products that will fit

into the network environment better than the current crop. A database manager derived from dBase II is one, and the entire Visi-series is another. Developments such as these will move networks from being merely convenient to indispensable.

Novell ShareNet X

Novell, like 3Com, produces two PC-related network systems. One, ShareNet X, uses a PC-XT as a dedicated file server, with a network based on Ethernet. The other product, ShareNet S, uses a 88000-based dedicated file and print server in a star topology. Unlike Nestar's PLAN 4000, it uses a multiwire cable to exchange data with the user stations. We'll look at ShareNet X first.

In contrast to PCnet, ShareNet X completely occupies the file server PC-XT.

THERE are few operational differences between ShareNet S and ShareNet X.

The only functions you can execute on the host are network status and a few file server-oriented utility programs. At the time we tested ShareNet X, the print spooler was still under development. Therefore, our tests were limited to file server functions only. Like most of the others, Novell's systems require a modification to PC-DOS on the user stations. It intercepts only those calls having to do with disk drives defined as network drives and passes everything else through to your system.

ShareNet X boasts a 1.4 megabit per second data rate and uses some sophisticated buffering techniques on the XT for speed. For instance, WordStar takes an agreeably quick 1.6 seconds to load across

the network. If you exit and load it again without having done anything else, it loads in only 1.2 seconds—with no disk accesses. It has been buffered in a memory cache on the host XT. We found that it would buffer up to 64K, resulting in some dramatic throughput gains for small or moderate-sized files. The disk caching, combined with a few other nifty techniques, was a clear indication that Novell knows its way around an operating system. Indeed, maybe it should have written DOS 2.0. The utility programs are UNIX-like, providing the gamut of user and file administration functions. ShareNet comes with a neat little programming tour de force called Snipes. It's a classic game in which your character can cruise through a maze, where it shoots a variety of objects and critters. The difference is that when two or more of you play it on the network, you're in the same maze. There you are, happily blasting everything in sight when another user's character glides into your maze and blows you to smithereens. The network version of Snipes runs on monochrome monitors and, in addition to being fun, is indicative of the way data can be shared among multiple stations, given the right programming.

There is an optional electronic mail subsystem, which provides the usual message storage for users and has an "urgent" feature that alerts a user to important messages. Quite a bit of attention has been given to security provisions on ShareNet, steering users to certain drives, directories, and files. As with UNIX, a user may belong to a group and have all the privileges of the group automatically, while maintaining private files that the rest of the group does not have access to.

Novell's system monitor, the visible portion of the program that operates on the file server XT, is well thought-out. It shows the activity of up to six PCs and gives continuous information on network activity and the number of disk I/Os pending. While some of the information might be described as a little "gee whiz," it certainly keeps you informed.

ShareNet appears to be as strong a foundation as any, given the number of

extensions to DOS that can be called by a programmer writing application programs. It permits the full range of multiuser functions, including file and record locking, security levels, and hierarchical directory navigation.

Novell ShareNet S

For networks that look so different physically, there are few operational dif-

ferences between ShareNet S and ShareNet X. Like PLAN 4000, ShareNet S uses a 68000 to run the file system. Unlike PLAN 4000, there is also a Texas Instruments 16-bit microcomputer chip for every two users hooked up to the network. It provides sufficient intelligence that communications can be overlapped among stations, raising the overall effective speed beyond the nominal 500,000

bits per second on each line. Remember, ShareNet S is a star configuration, with a direct line running from every device on the network to the server. All user-to-user communications go through the server. You can increase the capacity of a ShareNet S server in increments of six users at a time to a maximum of 24. It uses a terminal, like 3Com and Nestar.

As you can see from the charts, the per-

Definitions for Networks

An explanation of networking terms that appear in the article.

When we say network, we are referring to a generic means of hooking machines together. There are two major types of networks: collision-detecting and token-passing. The former is the idea on which Ethernet is based; that is, each machine on the network has an "address" or code to which it responds. Any machine can send a message (of standard length and format) to any other machine on the network. The recipient of the message replies with an acknowledgment to let the sender know that the message got through okay. If two devices attempt to transmit at the same time, a collision will result, forcing each device to retransmit. Each board pauses a brief, random amount of time before retransmitting, minimizing the chance of another collision. Each board listens for a carrier signal before transmitting, indicating that no other user is on the network, avoiding unnecessary collisions and retransmissions. Since the speed of the network is usually a million bits per second or higher, collisions are not a big consideration in network performance. Even on busy Ethernet systems, it's unusual to have more than a few collisions a day. The formal name for this routine is CSMA/CD, for Carrier-Sense Multiple Access/Collision Detection.

Token-passing networks are based on a

device or central computer that supervises the network, giving each device permission to send information. There are no collisions, since no two devices can transmit at the same time. Token-passing network supervisors usually are capable of balancing the load on the network by telling a very busy sender, "Shut up for a while and let somebody else talk." Neither type of network is limited by the speed at which it can transmit characters, but a megabit (one million bits per second) is typical, and 10 megabits is the maximum you're likely to see. The Ethernet standard covers networks with a speed of 1 to 20 megabits per second.

A network user is a station that uses the resources of the network. An example is a PC with only a floppy disk and no printer. A network server is a device or station that provides resources to the network. There are two kinds of servers, dedicated and shared. A dedicated server may be a PC-XT, which is unusable except by the network. Some vendors provide non-PC computers as dedicated servers. Shared servers also may be used as computers, even though their resources are shared by other machines on the network.

A file print server provides only hard disk to the network. It may be dedicated or shared.

A print server is a station that provides printing facilities to the network. It is shared, by definition, and may be part of the file server.

Print spooling is special software that coordinates and controls printing on the system. It stores characters headed for the printer, on disk or in memory, much faster than the printer could actually accept them, releasing network users far faster than if they had to wait for the printer. The software then directs the characters to the printer or holds it to be despoiled by a user.

You'll see the word node just about everywhere but here. It means any station on the network, whether it is a user, server, printer, or what have you. Its vagueness makes it useless.

Topology is another good networking word, a favorite of uninformed salesmen. It describes the way in which all the devices on a network hook up to one another. Most of the networks you will encounter are based on bus or star topology. Bus networks are simply a transmission medium (coaxial cable, fiber-optic cable, or twisted-pair cable) that runs from one device to the next, in no particular order. Star networks have a separate line running from every device on the network to a network controller or file server.

—B.M.

formance of ShareNet S was slightly worse than ShareNet X for tasks that did not stress the file server heavily. There were strong indications, though, that an XT-based network would be hopelessly bogged down in work that the 68000-based server would take in stride. Once again, the degradation curve becomes important as network loading increases.

Operation of the network from the file server is similar to ShareNet X, except that there are additional commands to handle the print spooler. In operation it is similar to 3Com's, except for additional features such as changing the priority or order in which spooled documents will be printed. From the user's point of view, there is no difference between ShareNet X and ShareNet S. An interesting feature of the ShareNet S interface boards is that they contain a bootstrap program in read-only memory. PCs without any disk drives can thus use the system as intelligent terminals.

Tecmar

Yes, Tecmar has a network, too, and you've been hearing about it for months. At press time, it was just coming out of the lab. Tecmar uses 3Com's communication boards, but shares little else with the 3Com system. Instead of concentrating on the minicomputer-like functions exemplified by most of the other networks in this article, Tecmar chose to exploit other capabilities of Ethernet and some of their other technologies. Basically it has combined voice and data on the same network and integrated it with telephone control hardware and software. The result is a unique communication system, one that nearly defies classification.

The big news with the Tecmar system is that not only can you send voice communications over the Ethernet cable, but you can digitize it, store it, and play it back. At the most trivial level, this means that you can make a PC into the world's most expensive phone answering machine. At the other end of the scale, it is the foundation for a sophisticated phone and communication management system. You can record a voice message on disk (4,000 bytes per second of speech) and

send it to one other person or an entire distribution list. It can play prerecorded messages and record responses for later playback. The digitized sounds can be analyzed or processed to modify the sound. Mostly, though, you'll just want to

THE TECMAR system is the foundation for a sophisticated phone and communication management system.

retrieve them and play them back over a speaker or telephone. The design criterion was for speech quality that sounded as good as normal telephone conversation, and Tecmar has achieved that end. The Ethernet companion board, as it is called, permits attachment of a tape recorder, footswitch, and a few other goodies, in addition to the telephone. Indeed, it can become your telephone, with only the handset plugged into the companion board. The software will dial, record phone usage, time calls, and figure out charges. The voice messaging system is truly a store-and-forward design, as the messages can be moved easily among PCs in the network.

In terms of more traditional networking activities, we caught Tecmar a little early in the design cycle. The software we tested was capable of moving data from one machine to another, but full file- and print-server subsystems were still in beta test. We were, however, able to simulate our file read and file creation benchmarks on the network to test its speed. It proved to be fast, executing the file create test in 23 seconds, while the phone management software was operational (but not busy) in the host PC. While we look forward to wringing out a full-blown data and voice network from Tecmar, the data portion

has taken a back seat to voice. While it appears that their system will have the same functionality as everyone else's, we will have to wait and see. Tecmar's use of the 3Com board would seem to guarantee full compatibility with Ethernet—a potential advantage.

In this new, nontraditional network application, voice messaging, Tecmar may very well have a tiger by the tail. We've used some mainframe-based voice messaging systems, and Tecmar's appears to be every bit as flexible—more so, if you have or will have an in-house PC network.

Documentation

There was great disparity in the quality and amount of documentation available with networks. 3Com's was the best, and, while there wasn't a "worst," PCnet's documentation could have been more detailed and better developed. For instance, in order to use the low-level file-locking protocols available from PCnet's BIOS, you have to request the documentation for that feature from AST or Orchid. There were minor differences in the AST and Orchid versions of the documentation, with the nod for quality going to AST. Only two of the vendors' manuals discussed interrupts and the potential for conflict, and only one of the two gave any suggestions on what you could do about conflicts.

Corvus' documentation, while brief, covered what needed to be said and did it succinctly. It actually went into a fair bit of detail on things like dealing with media defects, programming with semaphores, and even configuration for proper operation with programs like Visicalc and those from the Peachtree accounting series.

We mentioned Nestar's two thick volumes. If they had been typeset instead of typewritten, they would be two moderate volumes or one thick volume. The appearance of the Nestar documentation is not up to the level of professionalism so evident in its product. The contents, however, are just fine. The documentation is nicely broken down into user-oriented and system manager-oriented chapters.

Part of the ponderousness is due to the inclusion of the non-IBM operating system options as well as PC-DOS. There's a fair bit that could be eliminated from this manual for a PC-only network.

Novell's manual is typewritten in a large three-ring binder. It covers everything from physical installation of the system to use of the extended DOS calls for multiuser operation. We were able to review a proof copy of new documentation on the way to the typesetter. It looked even better than the original—more tutorial and detailed.

We said that 3Com's documentation was the best, and it is. It covers all that you need to know about installing and using the product, including some how-not-to's and what to do about it if you've done it wrong. The manual is typeset and indexed, with good illustrations where appropriate, something that most of the others lacked. Corvus had the only other manual with effective illustrations.

Conclusions

Throughout this article, you've read

the words new, developmental, beta test, coming soon, and under development. Our purpose was to separate the smoke

THE appearance of the Nestar documentation is not up to the level of professionalism so evident in its product.

from the fire, and there is no doubt that there is a bit of each in networking. You've seen what we've seen—everything from promises to products. Several manufacturers wanted a full mention in this article based on specifications of forthcoming products, anywhere from 2 weeks to 4 months away from introduction. Sorry, guys. Reality was required to make the

team. We grant you that this market will be considerably more mature 6 months from now, but one thing will remain the same: it will be divided between those companies that have their acts together and those who don't. We were frankly surprised that the market is as good as it is, this early in the game.

We didn't really have to call for help in installing any of the systems, but then we're not neophyte PC users. Based on the overall level of documentation, we recommend that if you're interested in networks that you pursue them through a dealer. Indeed, most of these products are available only through dealers. That's to your advantage: you have someone to hang it on when it doesn't work the first time.

Performance numbers: how much do they really matter? One of the networks we tested was clearly the fastest, another undeniably the slowest. Did that make one the winner and the other the loser? We called some users of PCnet, the slowest in our test, to find out if performance was a problem.

None cited speed limitations as an

Network	Type	Dedicated File Server?	Terminal Required?	Print Spooler?	Printer Type	Other (Non PC) Operating Systems?	Security 1-Poor 5-Excellent	Ease of Installation 1-Difficult 5-Easy	Cost: Board Server
PC Net	CSMA/CD	No	No	Yes	Par.	No	2	2	\$695 N/A
Sharenet X	CSMA/CD	Yes (XT)	No	No	—	No	4	3	\$595 \$4995 (XT)
Sharenet S	Token	Yes	Yes	Yes	Ser.	No	4	3	\$250 \$8785 (20MB)
Nestar	Token	Yes	Yes	No	—	Yes	4	4	\$595 \$19,995 (60 MB)
Tecmar	CSMA/CD	No	No	No	—	No	N/A	3	\$1645 (Voice) \$950 \$4995(XT)
3 Com	CSMA/CD	Yes	Yes	Yes	Ser.	No	5	4	\$950 \$12,500 (30 MB)
Corvus	CSMA/CD	Yes	No	Yes	Par.	Yes	2	2	\$495 \$3985

MB-megabytes

Considering Cost Effectiveness

When it comes to networks, the price tag depends on more than the cost per work station.

You've decided to buy a network, and you've read all about each system's capabilities and limits. Now you want the bottom line: the best network for your money. For all the networks, cost-per-user levels off at about nine work stations. The seven networks divide into two basic price ranges. Keep in mind that our prices are rough figures and do not include the cost of wire and some utility software.

The lower-priced networks include PCnet, Corvus, and Novell's Sharenet X and S. Obviously, PCnet is the least expensive network, provided you can live with the system's limitations. Although Novell's Sharenet X and Sharenet S basically performed equally, you must remember that the X system is limited to six users. If you have more work stations, the Sharenet S network is better in terms of price and capability. However, the Sharenet X price includes a PC-XT for a

server. The Corvus is cheaper than either Sherenet system and has the extra advantage of accommodating different microcomputers, such as the IBM PC and Apple. The only other network that offers such flexibility between microcomputers is Nestar, the most expensive system we tested. Corvus uses twisted pair cable, which is about one-fifth the price of coax.

Nestar, along with Tecmar and 3Com, are in the higher price range. Nestar remains the most expensive network. However, it includes the largest disk and a tape backup and the price becomes competitive when there are 13 or more users on the system.

The price from 3 to 20 users does not vary much for the Tecmar network. The big advantage of the Tecmar system is its capability for voice digitization. Further, the Ethernet companion board for this function is included with each machine.

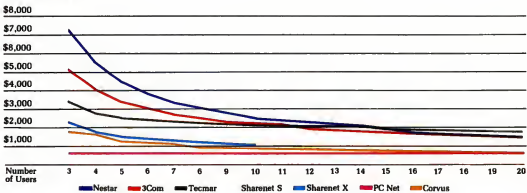
The price quoted in the chart for the Tecmar system also includes an XT server (not dedicated), since we can't imagine using this network without a hard disk. You may prefer Tecmar's expansion chassis and hard disk as an alternative.

The 3Com EtherSeries, which is priced between the Nestar and Tecmar, has several advantages that justify its price. It is the only true Ethernet system, which makes it compatible with many other Ethernet products. The system also has great flexibility, because it is fast and can accommodate many users. The system also has numerous powerful utility programs.

The advantages and disadvantages of each network must be weighed against price. The bottom line is that the least expensive system may not be the one for you.

—Lisa Ellen

Cost Per User



obstacle. One user, who was using dBase II across the network (although not in multi-user mode) liked the ease with which it could be accessed from any terminal. She had set up the recommended batch files to lock data files in use, and while the process was a little unwieldy, she found it effective. Most users liked the low cost of PCnet and because of it, were willing to live with its other shortcomings. One user

cited difficulty of installation, mentioning conflicts with other boards in the system using the same interrupt.

We found this to be a problem with network boards as a whole, not just with PCnet's. There are precious few interrupt lines available on the PC, and there is no agreement on which manufacturers or functions will use what line. Expect some problems if you have various multifunction boards in your PCs. Expect more problems if you have the older, 64K system board. Oh, you'll get it to work, but you may wind up disassembling COM2: or some such thing on the system. Another problem that surprised us was the poor quality of coaxial terminations on all but the 3Com cables. After experiencing some flaky behavior, we hooked random pieces of co-ax, supplied by the manufacturers, to the oscilloscope and a signal source. We found lousy, attenuated cables, bad joints, and general junk. Overall, the quality was bad enough that we couldn't single any manufacturer out as a culprit. Maybe these cables have been to a lot of shows and have been abused, but we didn't expect them to be this bad. In any case, they are something for you to look out for if you find yourself in the market.

We were glad to hear that 3Com is supporting the efforts of software houses to produce network-compatible products, such as database managers and spreadsheet programs. Doubtless, other network vendors will follow suit. We fear, however, that such efforts are doomed to repetition, if not to failure. MS-DOS is not a multi-user operating system. Each network vendor adds his own extensions to it, and the software authors must conform to these extensions. Perhaps the next release of DOS will have multiuser extensions that remove the dependencies on nonstandard DOS calls. Maybe there even will be a standard way to recognize and integrate calls to a nonlocal resource, such as Digital Research's CP-Net or some of the distributed processing schemes found on minicomputers. Until then, distributed databases will be unlikely, and you may have to buy your database manager and other software from the network vendor or

his dealer if you want full utility.

There are large disparities in the effectiveness of security provisions on the various networks. Some, like PCnet, are strictly for people who like each other and understand the way things work. Corvus' protection scheme is in the same league, maybe half a step up. The big boys in file protection—Nestar, 3Com, and Novell—are all very minicomputer-like, with security provisions that most resemble VAX VMS or UNIX. The system administrator has complete control over group and user permissions, use of system facilities, and the like. Users are adequately protected from one another and from themselves. These high-end systems, especially 3Com and Novell, also have the best print-spooling facilities, if use of a serial printer isn't a drawback. (See the chart for a complete

Product Information

For list prices of the products, see chart.

OmniNet

Corvus Systems, Inc.
2029 O'Toole Ave.
San Jose, CA 95131
(408) 946-7700

CIRCLE 548 ON READER SERVICE CARD

Plan 4000

Nestar Systems, Inc.
2582 East Bayshore Rd.
Palo Alto, CA 94303
(415) 493-2233

CIRCLE 547 ON READER SERVICE CARD

EtherSeries

3Com Corporation
1390 Shorebird Way
P.O. Box 7390
Mountain View, CA 94039
(415) 961-9602

CIRCLE 546 ON READER SERVICE CARD

Elen

Tecmar, Inc.
8225 Cochran Rd.
Solon, OH 44139
(216) 349-0600

CIRCLE 545 ON READER SERVICE CARD

ShareNet X and S

Novell, Inc.
1170 North Industrial Park Dr.
Orem, UT 84057
(801) 226-8202

CIRCLE 543 ON READER SERVICE CARD

PCnet

Orcbid Technology
47790 Westinghouse Dr.
Fremont, CA 94539
(415) 490-8586

CIRCLE 542 ON READER SERVICE CARD

OUR
*purpose was to separate
the smoke from the fire,
and there is no doubt
that there is a bit of
each in networking.*

listing of usable printer types.)

Overall, our tests were very enjoyable. It was a real pleasure to use most of these networks. As we said before, they were, overall, surprisingly good. Oh, we have our complaints, but they're mostly the result of immaturity in the marketplace. We anticipate, though, that the good ones will get better and that there will be some quick-and-dirty entries in the market, whose only claim will be low price. Our advice: Assess your needs carefully, make your choices, and don't be afraid to pay for the capabilities you need. /PC

Editor's note: See also "Getting hooked on PCnet," and "Getting the Net Working," in this issue.

FOR \$54 WE'LL KNOCK YOUR SOCKS OFF.

AutoCAD™ brings so much design/drafting power to the IBM PC* you'll be astonished.

Send us \$54, we'll send you the Demo.
You'll see.

You can create user-defined screen menus from ordinary text files. You can define parts libraries simply by drawing them. You'll focus AutoCAD's power in tight on your own specialized requirements.

Specifically AutoCAD can... calculate and display the distance between any two points or the area enclosed by any number of points automatically... provide 127 layers and colors for selective viewing or plotting as if on transparent overlays... work at any level of detail using full bi-directional zoom facility... create and edit drawings of any size, to any scale... move, copy, modify, erase, rotate, and scale vertically and horizontally... generate repetitive patterns automatically... use as components both previously created drawings and basic elements such as a line of any width, a circle, arcs, and solid filled areas.

Drawings are created with a light pen on screen menus, digitizing tablet, commands on the keyboard, or any combination. All systems support Summagraphics and Houston Instrument digitizers and the complete range of both Hewlett-Packard and Houston Instrument plotters.

AutoCAD is the definitive breakthrough for architectural or landscape drawing... drafting for mechanical, electrical, chemical, structural and civil engineering... and printed circuit design.

You'll see. Chances are, then, you'll want AutoCAD for your very own. And that will cost you just \$1000.

* Minimum Configuration Requirements for IBM PC
(note that there is a choice of three differing versions)
PC-DOS Operating System version 1.1
128K memory
RS-232 serial port IBM compatible at standard address

- 1-IBM dual screen version-monochrome display adapter with monitor
-color/graphics display adapter with monitor
- 2-Vectria version-Vectria VX384 on parallel port
-monochrome display adapter with monitor
(on the IBM and Vectria versions above two monitors are required)
- 3-Hercules version-Hercules graphics board
-IBM monochrome display adapter with monitor

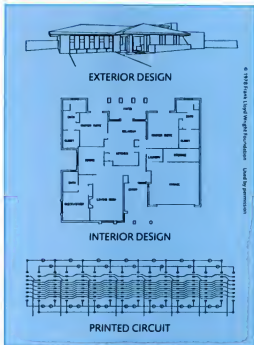
IBM is a registered trademark of International Business Machines Corp.
AutoCAD is a registered trademark of AUTODESK, Inc.

AUTOCAD

DIGITAL CONTROL SYSTEMS, INC.

45 New York Avenue, Framingham, MA 01701 • (617) 875-3555

CIRCLE 303 ON READER SERVICE CARD



Send the coupon.

DIGITAL CONTROL SYSTEMS, INC.

45 New York Avenue, Framingham, MA 01701

**Gentlemen: Here's \$54. Show me.
I'll be wearing garters.**

Name

Company

Address

City State Zip

Mass. residents add 5% sales tax

☐ VISA ☐ MASTERCARD Card #

Expires Signature



SOFTWARE FUSION

APX

CORE EXECUTIVE™

INTEGRATE VIRTUALLY
ANY SOFTWARE

The APX CORE EXECUTIVE enables you to:

- ★ Run several programs simultaneously.
- ★ Control each program through interactive windows.
- ★ Change any window's size and position, and scroll within any window.
- ★ "Cut & paste" from one window to another automatically.
- ★ Save typed sequences for replay with a single keystroke.

All this, and more.... **\$195.00**

The APX CORE EXECUTIVE
(available for the IBM PC with DOS).

Dealer inquiries invited.

Application
Executive
Corporation

800 Broadway
Suite 4C
New York, NY 10012
(212) 226-6347



APX

CIRCLE 129 ON READER SERVICE CARD

If your PC is looking for a connection, PCnet is a medium-range local network that is fast, friendly, and will fit most applications.

Getting Hooked On PCnet

PCnet

Orchid Technology, Inc.
47790 Westinghouse Dr.
Fremont, CA 94539
(415) 490-8586

List Price: \$1,490, includes 2 adapter cards, 20-foot cable, and software

CIRCLE 583 ON READER SERVICE CARD

PCnet is a low-cost local area network (LAN) developed by Orchid Technology. (It is also available through AST and Santa Clara Systems; see "Battle of the Network Stars," in this issue.) PCnet lets IBM PCs, and PC compatibles such as Eagle, Columbia, Compaq, and Corona, share hard disks and printers. Before we look at the technical details of PCnet, let's look at just what a local network is, and why you might want to consider purchasing one.

Defining a LAN

A local network connects two or more computers and enables them to share data, programs, and hardware. It makes sense to use a network to share expensive hardware such as hard disks, color plotters, or

letter-quality printers. However, it usually does not make sense to share inexpensive hardware such as floppy disks or dot-matrix printers.

COMPUTERS
*connected by a local
network are usually
fairly close together
geographically.*

Sharing data is the most compelling reason to consider a local network. One advantage of sharing data with a local network is that everyone on the network has access to the most recent version of the data. The simplest, cheapest alternative to using a local network to share data is to make several copies of the file on floppy disks and give each user a copy. But there are drawbacks to that simple solution. Many data files are too large to fit on one

or two floppy disks and need the space of the Winchester disk, which allows much faster access than the floppy disks.

For many applications, a more pressing problem with sharing data files via floppy disks is that it probably is not practical for keeping the copies of the file absolutely current. Naturally, for seldom-changed files, this isn't much of a problem. But for frequently updated files, having some users looking at out-of-date versions of the files can often cause real difficulties.

Computers connected by a local network are usually fairly close together geographically. Many local networks serve a single building, although it's not uncommon to have several buildings served by a single local network, such as a local network for a university campus.

Local networks can be classified by the pattern you would see if you drew a diagram of the location of all the computers connected to the net. This pattern is called the "topology" of the network. In a star network, each computer is connected to a central computer, much like the spokes on a bicycle wheel are attached to the hub. A

ring network topology connects each computer to two other computers, forming a ring. A bus arrangement connects all the computers to a common wire, but, unlike the ring, the two ends of the network are not connected together. All three ways of arranging local networks are useful, and commercial and research networks have been designed that use one or another of the three network patterns. Currently, the bus network topology is the most common, and the ring arrangement is probably least common.

PCnet Parameters

PCnet uses a bus topology. So, all computers using PCnet are attached to a cable that runs in a single line throughout the local network area. The cable is the standard 75-ohm coaxial cable used to connect your TV to cable services such as HBO or MTV. This RG59B/U cable is fairly flexible and light and can be used for networks of up to 3,000 feet. It currently costs about 30 cents per foot. The heavier RG11/U cable, which costs about twice as much as the RG59, is used for more extensive networks of up to 7,000 feet. Good news for do-it-yourselfers: you can buy the tools and connectors needed to construct cables for PCnet at many electronics stores.

PCnet is a baseband network that uses carrier-sense multiple access with collision detection (CSMA/CD) as the method of sharing the local network channel.

For this review, I used PCnet Version 2.0 with PC-DOS Version 1.1. PCnet is currently available for either DOS 1.1 or DOS 2.0. However, PCnet does not support networks where some machines run

Although most PCnet installations will have far more PCs on the net, I tested it with two PCs because that's all I could easily get my hands on. For most of my testing, a greater number of PCs on the network wouldn't have made any significant difference. For this review, one PC was configured with a Tallgrass Technologies 12-megabyte hard disk, the other with only floppy disks. Both PCs had 320K of memory, and so I was able to use RAM disks with the network.

The Tallgrass model 12+12 has a 12MB hard disk and a 12MB cartridge tape for backup. PCnet supports almost all of the hard disks that are available for the PC. In addition to the PC-XT, it handles Santa Clara Systems, Tallgrass, Tecmar, Microcode, QCS, Detamarc, Davong, and Corvus. Since I haven't tried any of the other supported systems, all I can report is that PCnet works fine with the Tallgrass system.

PCnet costs about \$750 per computer connected to the network. Its greatest strength is that it lets users share a standard PC-XT or other hard disk. But the crucial feature is that the so-called "server PC," which shares its disk with other "user PCs," does not have to be dedicated to that task. A user can sit at the XT and use it normally, while the XT disk also is shared by other PCs on the network. Naturally, if one or more of the other users on the net were doing lots of disk input/output the person using the XT would notice some degradation in response time. But what makes PCnet and other local networks practical is that it is unlikely that everyone will use the net at the same time. Research has shown that local network traffic is very "bursty"; that is, there are long lulls when nobody uses the net interspersed with occasional short "bursts" of heavy activity. Due to the intermittent nature of network activity, PCnet allows a regular user to work at the keyboard of the shared PC with minimal diminution of effectiveness.

PCnet lets users share a central hard disk, such as a PC-XT. What sets PCnet apart from most of the other networks for the PC is that the PC, with the hard disk, is not dedicated strictly to network use. For smaller networks, this significantly reduces the initial investment needed for installation.

Most other local networks require a dedicated hard disk. The 3Com Ethernet

system allows an XT to be used as the file server, but the XT must be dedicated to that task and can't be used locally. The Corvus OmniNet system requires a dedicated Corvus disk as the file server. Nestar's Plan 4000 and Novell Data System's ShareNet also use dedicated file-server machines; they cost quite a bit more than PCnet for a minimum configuration.

PCnet also lets user PCs run programs on a server PC. This "remote execution" feature may be useful in some situations, but it seems much less advantageous than the disk sharing provided by PCnet. The server PC is given priority, and, when a

P CNET DOES
not support networks
where some machines
run DOS 1.1 and others
use DOS 2.0.

user PC submits a program to be executed, the remotely submitted job is queued until commands typed from the server keyboard have been completed. When the server PC is ready, a short beep is sent to the user PC. I didn't spend much time testing this feature. With some clever custom programs, I can imagine that it might be useful. But I doubt that many PCnet users take advantage of this feature.

A simple program to allow shared use of a printer attached to a server PC is also provided with PCnet. It works, and it is fine if the printer is seldom used. But in Version 2.0, the support of the printer is quite limited. When several people need to share a printer, what you really want the "printer server" to do is accept material for printing, even if the printer is busy at the time. The data that needs to be printed would be stored temporarily on disk and the print request entered in a "list of things to do" so that the server can start printing the next job as soon as the current one is completed. Since the PCnet printer server does not support these more advanced features, if the printer is busy, you'll just have to wait and ask again later. Again, this restriction will not affect all PCnet applications.

A RING
network topology
connects each computer
to two other computers,
forming a ring.

DOS 1.1 and others use DOS 2.0, since there are incompatibilities in the two file systems. (If you use DOS 1.1 to write on a DOS 2.0 disk, you will ruin the disk.)

I tested PCnet using only two PCs.

Installation Specs

PCnet is easy to install once you figure out the documentation. At the time I wrote this review, the Version 2.0 PCnet User's Manual was marked "preliminary." It was. The 18-page manual included some sections that were clear and easy to understand, but other sections certainly were not. In fact, once I got everything working, my overall evaluation was that PCnet's one weakness was its inadequate documentation.

The PCnet hardware is easy to configure. First, you assign a unique "network identification number" to each work station that will be on the net. It's easy if you understand hexadecimal numbers and have had a little experience setting DIP switches. I had little trouble getting the switches right the first time, but since I had done this sort of thing a few dozen times before, I was able to read between the lines of the manual. If Orchid would include a simple BASIC program on the software distribution disk, the user could ignore hex altogether by typing the desired board address in decimal, and then copying a DIP-switch pattern generated by the program.

Once the board ID number has been set, the network board is plugged into any slot of the PC. It is a full-length card, and Orchid thoughtfully provides a plastic board-support to snap into the front of your PC. Initially, the process of getting

cable supplied by Orchid Technology that already had the correct BNC "T" connectors installed. Assembled cable for PCnet is inexpensive: Orchid charges \$20 for 20 feet, \$29 for 50 feet, and \$50 for 100 feet of cable, including the required BNC connectors.

For small PCnet configurations, I think that purchasing the cable when you buy the network is desirable. For larger networks, or in situations where you have to move machines and reconfigure the network now and then, you may want to buy a tool (for about \$200) to fabricate your own cables.

The challenging part of installing PCnet comes after the adapter boards are configured and the cables are connected. I had trouble getting my system up and running, but my problem is not a fair indication of what an average user would face, since it turned out that the problem was not with the PCnet software. It was due, instead, to an incompatibility between PCnet and the Seattle Computer Products Floppy Disk software. (After I finally discovered the source of the problem, I was able to use the AST SuperDrive memory disk software in conjunction with PCnet with no problems.) I doubt that this problem would have arisen with DOS 2.0, since installable device drivers are now used by all memory-disk vendors. The reason that I think there no longer would be any conflicts is that with installable device drivers, everyone follows the same rules, as defined by IBM: Before DOS 2.0, it was every vendor for himself, with lots of room for incompatible modifications to DOS.

Servers, Sharers, and Users

PCnet requires that all machines attached to the network be designated as "shared PCs" or "user PCs." The distinction is straightforward: a shared PC (sPC) has resources that are shared with other work stations on the net. A user PC (uPC) does not share any of its resources with other PCs on the network, but it may use the resources of one or more sPC machines.

PCnet creates the illusion that remote, shared disk drives are attached to a user PC. After a network is configured, a user has one or more additional drives that are available on the network. For example, a user PC with two floppy disk drives (drives A and B under PC-DOS) might also

have a drive C that is all or part of a Winchester hard disk on a server PC. Once the system has been booted, the user actually can "log on" to drive C. All of the standard PC-DOS utilities, such as COPY or CHKDSK, work on network drives exactly the same as they do on local drives.

ALL OF THE
standard PC-DOS
utilities work on
network drives exactly
the same as they do on
local drives.

There are fancier ways to implement networking, but I found the PCnet disk-emulation approach easy to learn and use. When the shared disk is a Winchester or a RAM (memory) disk, the average access time is so fast that most users will not know that the disk isn't local. Obviously, if there are 25 PCs all on one network, and they all decide to back up their files at the same time, there will be noticeable delays. But most of the time, local networks are idle, so the chances are quite good that when a given user wants to copy a file from a shared disk, nobody else will be using the network at that instant.

When a given shared PC is configured for the network, you are able to decide on an individual basis which user PCs will be given access to the various real disks on the server PC. For example, I had formatted the Tallgrass hard disk as four logical disks of 3 megabytes each. (This makes backup with the 3M cartridge tape easy, since each of the four tracks of the tape stores 3 megabytes of data.) When I installed the Orchid Technology network software for the server PC, I decided to let the user PC have access to only two of the four Tallgrass logical disks. This meant that when someone was using the server PC, there was no conflict between the user PC and the server for the nonshared logical drives.

In Version 2.0 of the PCnet software that I tested, each drive on the server PC was given a meaningful name. However, due to the disk-emulation approach used

PCNET REQUIRES
that all machines
attached to the network
be designated as "shared
PCs" or "user PCs."

switches set and boards installed takes about 10 to 15 minutes per PC. Once the process is clear, it takes only 5 minutes per machine.

After the PCnet board is installed, cable is run between the network computers. Hooking cable between computers on the network is simple, as long as you have the correct cable and connectors. I used



Computer Outlet

We offer the largest selection of software and hardware
for Apple, Atari, Commodore, IBM and Kaypro at
25 to 40% off retail.

1095 East Twain, Las Vegas, NV 89109 • Mon-Fri. 8AM to 6PM, Sat. 9AM to 5PM

Printers

NEC	
NEC 8023A	\$ 475
NEC 3530	\$1599
NEC 7710	\$2099
NEC 7730	\$2099
NEC 3550	\$1899

Dieblo	
Dieblo 820R (25CP)	\$ 989
Dieblo 830R (40CP)	\$1839
Dieblo 830SR (40CP)	\$2599

Epson	
FX 80	\$ 599
FX100FT	\$ 799

Smith Corona	
TP-1 Parallel	\$ 499

Okidata	
ML82A	\$ 399
ML83A	\$ 615
ML84P	\$1049
ML84S	\$1149
ML82	\$ 699
ML83	\$ 799

IDS	
Microprim	\$ 480
Prim 132 (w/Sheetfeed & Graphics)	\$1429
Prim 132 (w/Sheetfeed, Graphics & Color)	\$1629
Prim to IBM Cable	\$ 45

Citih	
8510 Prowriter	\$ 365
F10 Starwriter	\$1349
F10 Primmaster	\$1599

Mannesmann Tally	
MT 180L	\$ 629
MT 1802 (Parallel)	\$1989
MT 1805 (Serial)	\$1689

Gemini	
Gemini 10	\$ 299
Gemini	\$ 439

Qume	
Qume Sprint 11	\$1429
Tractor Feed	\$ 175
Printer Interface	\$ 75

CP/M 8"

Digital Research

CRISC	\$ 99
CR-80	\$329
Perseus/MT	\$145
Speed Programming Package	\$599
CIS Cobol	\$199
Access Manager	\$253
Display Manager	\$140
SuperSort	\$140
SpellStar	\$ 89
CalcStar	\$299
InfoStar	\$299
ReportStar	\$299

Micropro International

WordStar	\$299
DataStar	\$179
MailMerge	\$139
WordStar (CPM 80)	\$299
MailMerge (CPM 80)	\$149
SpellStar (CPM 80)	\$149

New Products



Corona Desktop Computer

IBM COMPATIBLE Includes 2 320K drives, 128 K memory. Graphics, serial/parallel ports, high resolution monitor, MS DOS, GW BASIC, Multimate wordprocessing, PC Tutor.

\$2595

Corona Desktop Computer

Same as above with one 320K floppy and one 10 megabyte hard drive.

\$3995

Corona Portable Computer

IBM compatible two 320 drives, 128K memory. Graphics, serial/parallel ports, hi-resolution monitor, MS DOS, Multimate wordprocessing, PC Tutor, GW Basic.

\$2545

Corona Portable Computer

With 1 320 drive and 10 MB hard drive.

\$4295

Monitors

Amdak	
Color II	\$879
Color III	\$349
Amdak V310 Green	\$179

NEC	
NEC JB 1201M	\$189
NEC JB 1250	\$109

Leading Edge	
Gortile Monitor (Hi-Res)	\$ 85

USI	
Ambor Monitor 12"	\$149

Quadram Quadchrome

- Hi-Res RGB Monitor
 - Non-Glare Screen
 - 690 x 240 Resolution
- \$549**

Peripherals

Kraft Joystick	\$ 45
TG Joystick	\$ 39
TD Trackball	\$ 39
Microsoft 84K Ramcard	\$599
Microsoft 256K Ramcard	\$599
Hayes Smartmodem 300	\$299
Hayes Smartmodem 1200	\$499
Hayes Smartcom II Terminal Pk.	\$ 72
Anchor Automation Mark VI Modem	\$179
Quadram Microfazer w/Power Supply 32K	\$185
Verawriter Graphics Tablet	\$239
Koala Touch Tablet	\$ 85

We Carry the Full Line
of Quadram
Multi-Function Boards

IBM

Personal Computer



Includes 64K IBM-PC with
two 320 KB floppy disk
drives, controller color
graphics card,
monochrome monitor

\$2839

★★ Stocking Stuffers ★★

Microsoft Mouse	\$134.00
Hayes Smartmodem 1200 B w/Smartcom II	
Complete plug-in system	\$429.00
Verbatim Disks (5/D w/Library Case)	\$ 24.00
Box of Maxell Disks (D/D) w/color coded markers	\$ 40.00
Flip'n File Diskette Box (Holds 50 Disks)	\$ 21.00
Diskette Mailers (5 to Pkg.)	\$ 3.50
Diskette Holder Box (Multi-Color, Holds 10)	\$ 2.50
Disk Savers (Protector Sleeves, Box of 12)	\$ 4.50
Orange Surge Protector	\$ 95.00
Perfect Data Head Cleaning Kit	\$ 19.00
Elephant Disks (D/D)	\$ 30.00
Koala Touch Tablet	\$ 85.00
Flip & File Diskette Box w/Lock (Holds 25)	\$ 18.50
Lotus 1, 2, 3	\$329.00

Business & Utilities

Advanced Operating Systems

The Programmer \$129

Applied Software

Versatorm \$249

Ashton Tate

Class II (CPM 86) \$419

Class II (MS DOS) \$419

The Financial Planner \$419

Friday \$185

BPI Systems

BPI Personal Accounting \$139

Comprehensive Software

PC Tutor \$ 55

PC Pal \$ 27

Computer Software Technology

WordPC \$ 49

Continental Software

The Home Accountant Plus \$ 95

F.C.M. \$ 95

Property Management \$309

Datamost

Real Estate Investment Program \$ 79

Write-On \$ 85

Denver Software

Executive Accounting System

(128K) \$489

Digital Research

Concurrent CPM 86 \$309

C Basic 86 \$125

Pascal/MT + 86 \$235

Speed/MT Programming Pkg. 86 \$125

CPM Color 86 \$489

CPS Color 86 \$ 39

Engle Software

Money Decisions (Vol. I) \$129

Money Decisions (Vol. II) \$149

Money Pac (Vol. I & II) \$249

Einstein Corp.

Einstein Writer \$199

Einstein Speller \$ 95

Einstein Mailer \$ 53

Einstein letter series \$199

Social & Civic \$ 33

Writer, Letter, Spell, Social & Civic \$263

Fax & Geller

Quick Code (CPM 86) \$199

Quick Code (MS DOS) \$199

Hayden Software

Pia Writer \$129

Hayes Microcomputer Products

Smartcom II \$ 72

Hayes Terminal Program \$ 85

Howard Software

Real Estate Analyzer II \$159

Creative Financing \$169

Individual Software

The Instructor \$ 29

Innovative Software

T.M.H. III \$299

Fast Graphics \$199

IUS

Easy File \$239

Easy Writer \$299

Easy Planner \$159

Accounts Receivable \$399

Accounts Payable \$399

General Ledger \$399

Financial Management Series \$699

Link Systems

Datasec \$199

Microcom

Microterminal \$ 62

Micro Lab

The Tax Manager \$159

Micro Pro

3 Pak WordMail/Spell \$519

2 Pak WordMail \$419

2 Pak WordSpell \$429

Wordstar \$299

Mallmerge \$199

Spellstar \$199

InfoStar \$299

ReportStar \$119

Starburst \$119

Microsoft

Basic Compiler (MS DOS) \$249

Business Basic Compiler (MS DOS) \$379

MS Pascal Compiler (MS DOS) \$329

Microsoft C Compiler \$399

Multiuser/Star \$186

Multiuser/Star \$186

Multiplan (MS DOS) \$179

Microstar

Crosshair \$129

North American

Business Systems

Answer \$159

P&L Corporation

Personal Investor \$ 86

Peachtree

General Ledger \$239

Accounts Receivable \$239

Accounts Payable \$239

Peach Pak (GL/AR/AP) \$239

Peachtree 5000 \$239

Perfect Software

Perfect Writer \$ 99

Perfect Speller \$ 99

Perfect Filter \$ 205

Perfect Calc \$ 105

Perfect WordPerfect \$ 242

Perfect PlanCalc \$ 379

Peter Norton Computing

Norton Utilities \$ 96

Select

Select Word Processing System \$299

Software Products International

Log Calc \$129

Pro Calc \$229

Log Quest II \$185

Log Quest III \$399

Software Publishing

PPS Report \$ 89

PPS File \$ 99

Software Systems

Wordmate \$299

Sorbus/ISA

Supercalc & Supercalc II Ea. \$179

Superwriter \$239

Spellguard \$125

Southeastern

Data Capture \$ 75

Synapse

File Manager \$ 96

Synagistic Software

Data Reporter \$185

VisiCorp

VisiCalc (256K) \$185

Desktop Plan 1 \$199

VisiTerm/Port \$199

VisiMail \$199

VisiDraw \$199

VisiSchedule \$199

VisiForecasting Model \$ 86

VisiWord \$249

VisiMap \$149

Education

Computer Software Technology

WordPC \$ 49

Davidson & Associates

Speed Reader \$ 49

Word Attack \$ 34

Meritblaze \$ 34

Designware

Spellchecker \$ 27

Edu-Ware

Algebra I \$ 27

Epyx/Automated Simulations

Jobbery \$ 30

Harcourt Brace

S.A.T. \$ 96

Lightning Software

MasterType \$ 34

Sirius Software

Type Attack \$ 27

Spinaker Software

Snooper Troops #1 \$ 30

Snooper Troops #2 \$ 30

Story Machine \$ 23

Face Master \$ 23

Rhymes & Riddles \$ 23

Kindercomp \$ 20

Hay Diddle Diddle \$ 20

In Search of the Most Amazing Thing \$ 27

Entertainment & New Products

Acorn Software Products

Everest Explorer \$ 15

Lost Colony \$ 20

Armork

Executive Suite \$ 27

Avallon Hill Game Co.

B-1 Nuclear Bomber \$ 15

Midway Campaign \$ 10

Computer Block & Bomb \$ 17

Andromeda Conquest \$ 15

Galaxy \$ 17

Dnaper River Line \$ 23

Voyager \$ 17

Draw Poker \$ 15

Computer Football \$ 17

Computer Facts and Fives \$ 17

Avant-Garde Creations

Laser Maze \$ 20

Federation \$ 20

Air Traffic Controller \$ 20

Blue Chip Software

Millionaire \$ 96

Broderbund Software

Apple Panic \$ 20

Serpentine \$ 23

Datamost

Pig Pen \$ 20

Space Strike \$ 20

Artic \$ 27

Tubeway \$ 23

Digital Marketing

Astro Dodge \$ 27

Epyx/Automated Simulations

Temple of Aphel \$ 27

Upper Reaches of Aphel \$ 15

Curse of the \$ 15

Crash, Crumble & Chomp \$ 20

Infocom

Deadline \$ 34

Zork I, II, III Ea. \$ 27

Starcross \$ 27

Winbase \$ 34

Information Solutions

The 25th Hour - 25:01 \$ 65

Innovative Design Software

Pool 1.5 \$ 23

Intelligent Statements

Kan Union's Professional \$ 45

Blackjack \$ 27

Asylum \$ 27

Microsoft®

Fight Simulator \$ 34

Microsoft is a Registered Trademark

To Order Call Toll Free **1-800-634-6766**

Information & Inquiries 1-702-369-5523 • We accept VISA and MasterCard

ORDERING INFORMATION AND TERMS: For Fast Delivery send cash, money orders or direct bank wire transfers. Personal and company checks allow 3 weeks to clear. Charges for C.O.D. orders are \$3.00 minimum or 1% for orders over \$300. School purchase orders welcomed. Prices reflect a cash discount on all orders. Please enclose your phone number with any orders. SHIPPING — Software: \$3.00 minimum. SHIPPING — Hardware: (Please call) SHIPPING — Foreign Orders: APO & FPO orders: \$10 minimum and 15% of all orders over \$100. Nevada residents add 5.34% sales tax. All goods are new and include factory warranty. Due to our low prices, all sales are final. All returns must be accompanied by a return authorization number. Call 702-369-5523 to obtain one before returning goods for replacement.

to share disks, these meaningful names were never used. Instead, from the user PC, shared drives were known as drives C or D or whatever, using the standard PC-DOS conventions. I didn't have a big problem with the drive names, although it was confusing due to the manner of mapping the drive names on PCnet. If a user PC has one drive installed, the first shared drive will be called drive B. Never mind that this shared drive B is really drive E or whatever on the shared PC. I became confused trying to remember that B really meant E when using files from the shared PC. In many cases this might not present a problem, since a person might use only one machine or the other, but not both. I think most users will adapt quickly to the drive names used by PCnet, as long as they don't have to move from one PC to another frequently. (Going to another user PC can be especially confusing, since it may have a different set of drives that it's authorized to use.)

One restriction of PCnet that might be important in some applications is that one shared PC can not access files from another shared PC. I think that most PCnet installations will have only one shared PC, so this restriction wouldn't apply. However, in those cases where there are multiple shared PCs, it is unfortunate that one shared PC has no convenient way to send a file to another shared PC. (There is

SINCE THE
ERASE command
knows nothing about
file locks, it will
obediently go ahead and
blow the file away.

one inconvenient way: a user PC with access to both shared PCs can copy a file from one to the other.)

File-Locking Problems

One limitation of PCnet is the way it implements file locking. When more than one user has access to a single disk, precautions must be taken to guarantee that only one person is able to access a given

file at the same time.

The correct way to enforce this important restriction is to have the operating system (PC-DOS) perform the file-locking service. But PC-DOS was designed as a single-user operating system in which the file-locking problem doesn't exist, since only one person can use the system at one time. PCnet provides a layer on top of DOS that attempts to provide a file-locking service, using so-called "named locks." Any user PC can request that a lock be set or reset for a given file on a server PC. When this is done, the PCnet software makes a note that the locked file is in use. Any program that knows enough to check with PCnet and ask if the file is locked before using it will work correctly.

In a more recent version of PCnet (2.0b), Orchid Technology has added another protection that reduces the problems that can occur when multiple users are authorized to share the same disk. When a user opens a file for writing, Version 2.0b automatically locks the File Allocation Table (FAT) that PC-DOS uses to manage the allocation of disk space. Since I didn't use this feature, I don't know how well it works.

If everyone is living by the same rules, all is well with PCnet. This will be true for a system of application programs, all written with the PCnet form of file locking in mind. Right now, a special version of the DataFlex database package is available that takes advantage of PCnet. According to Orchid Technology, a PCnet version of dBase-II will also be available in the near future.

But as soon as someone ignores the PCnet file-locking rules, problems can occur. For example, all of the standard DOS utilities and commands do not observe the named file-locking service provided by PCnet. This means that a user PC could request a lock on a file and think that all is well. In the meantime, another user with access to that disk might choose to erase the file. Since the ERASE command knows nothing about file locks, it will obediently go ahead and blow the file away. The program on the user PC would think all was well, accept commands to update a record, and unlock the file.

The best solution to the file-locking problem would be for Microsoft and IBM to recognize the importance of networking and offer an improved DOS that would provide the needed features. Another

alternative would require Orchid Technology to build a more comprehensive layer on top of PC-DOS. Since that's another way of saying "write an operating system," I doubt that it is practical for the market niche that PCnet serves. There are lots of applications where the users are not hostile to one another and where the

AS A USER,
all I care about is how
long it takes to get a
certain amount of data
from one machine to
another.

protection offered by PCnet is adequate. However, there are many other applications where the PCnet approach to file locking doesn't provide adequate protection.

Speed Testing

PCnet transmits data at about 880,000 bits per second, using the Intel 8274 multi-protocol serial controller. (Orchid's product literature and advertisements round this figure up to 1 megabit per second.) The Corvus OmniNet network uses about the same data rate as PCnet. Plan 4000 from Nectar runs at 2.5 megabits per second, while 3Com's Ethernet for the PC has a 10-megabit per second data rate.

Your real question is probably "Is PCnet fast enough to do what I want to do?" According to my tests, the effective speed of PCnet in transferring a file from one PC to another is about 15,000 bytes (characters) per second. This figure assumes a transfer from a RAM disk on one machine to a RAM disk on another machine, with PCnet connecting the two machines. For the test, I copied a file of 120,987 bytes using PCnet, with the file read from a memory disk at one end and written to a memory disk at the other. The average time in four trials was just over 8 seconds to transfer the file.

It's important to realize that the 15,000 characters-per-second data rate is calculated based on the amount of user data that is shipped in 1 second. All networks have

to send a substantial amount of "house-keeping" in addition to the user's data. But as a user, all I care about is how long it takes to get a certain amount of data from one machine to another.

To put the 15,000-characters-per-second effective transfer rate into perspective, PCnet can transfer the amount of data held on a DOS 1.1 double-sided diskette (320K) in about 22 seconds. Since most practical uses of a local network involve much smaller amounts of data, the answer to the question "Is PCnet fast enough?" is a definite "Yes!"

For additional testing of the speed of PCnet, I moved a small file with 53,626 bytes between various combinations of disk devices. To get an idea of how much overhead was involved with using a memory disk, it took only 0.75 seconds to copy the 53K file from local memory disk to local memory disk! Using memory disks on both computers with PCnet in between took 3.8 seconds.

With the Tallgrass hard disk used locally (no network involved), it took 3.09 seconds to copy the 53K file. It took 9.15 seconds to copy the file from a local memory disk to a remote hard disk using PCnet. However, it took only 4.14 seconds to copy the same file from a remote hard disk to a local memory disk using PCnet. (There's a reason for the large discrepancy: the Tallgrass disk does a "read after write" verification that slows down reading significantly.)

Interface Documentation

For OEMs and very advanced users, Orchid Technology will supply technical documentation for a low-level CSMA/CD datagram interface that can be used to construct high-level protocols. I want to stress that the vast majority of PCnet users would never need to learn these low-level technical details, since the high-level PCnet software does everything most people would want to do.

The documentation for the low-level network details is written for experienced 8086 assembly-language programmers. As such, it is fairly tough reading and could use some additional polishing. To experiment with the functionality provided by what Orchid calls the "Network Interface Operating System (NIOS)," my associate, Glen Fisher, wrote some programs in C that used the network system calls. We found that the NIOS system calls did what

the specifications said they would do. Glen's programs were able to use the datagram service of NIOS to ship files over the network, without using any of the high-level PCnet or PC-DOS tools. I suspect that we may have been the first non-Orchid Technology customer to use these features, since we discovered some errors in the manual. After a couple of phone calls to Orchid, Glen got the system running. I want to emphasize that using the low-level NIOS is not a task to be undertaken lightly. It works, as advertised, but requires a significant amount of technical expertise.

Even so, I am impressed that Orchid makes the low-level "hooks" available for advanced users. Although it wasn't practical to build a significant application using the NIOS for this product review, experience convinces me that it would be possible and practical to undertake such a project if we needed to in the future. Orchid Technology provided very good technical support and was able to resolve our problems on the spot. For customers with special requirements, it will supply reconfigured network software that uses a larger packet size or allows more simultaneous streams of data to be active on the network at once. (Currently, the limit is three streams. If you are willing to use more memory for buffers, Orchid software is capable of handling 256 streams of data at once.)

P
CNET IS ONE
of the most cost-
effective local networks
currently available for
the PC.

In summary, PCnet works well and is one of the most cost-effective local networks currently available for the PC. It is a medium-performance network adequate for most PC applications. Although there are faster networks for the PC, PCnet is fast enough for most users. It is also reliable and cost effective. If you need a local network, PCnet deserves serious consideration.

/PC

TALL TREE SYSTEMS

presents:

JFORMAT for DOS 1.10 \$60

Electronic Disk, Printspooler, 8 and 10 sector formatting, JET, single, dual, quad, 8" and hard disk support.

introducing:

INSTALLABLE DEVICE DRIVERS FOR DOS 2.00

JETDRIVE \$40

The only Electronic disk to work on any memory board. Contents restored after Ctrl-Alt-Del. Plus our famous JET (high-speed file transfer) program.

JFORMAT-2 \$40

The only way to go beyond 360K on one diskette. Allows for 24 different formats up to 2.5MB size.

WINDRIVE \$40

Available for most Winchester hard disk drive systems. Source code permits adaptation and customization. The only way to have unlimited drive expansion and disk sharing. Additionally, all drives including the XT, will run under DOS 1.10 with Windrive.

JSPOOL \$40

Redirectable, Programmable Spooler with an arbitrary size buffer, xon/xoff, supports printing to serial and parallel ports.

Don't forget:

JRAM \$800

The only memory board which allows more than 640K bytes per system. 512K bytes controlled by a hardware pager. Includes JFORMAT and JETDRIVE.

TALL TREE SYSTEMS
1032 Ewell Court #124
Palo Alto, CA 94303
(415) 964-1980

CIRCLE 487 ON READER SERVICE CARD

VILLAGE INFORMATION

Village information rests upon many years of meeting hardware and software needs for research in science and education. We specialize in applications for the "SuperMicro" with its unique power for interaction between the user and information display, be it textual, numeric or graphic.

"SuperMicro" isn't any particular machine, but the realization an important concept in system integration. It's a microcomputer optimally configured with hard disk storage, maximum RAM, a math co-processor and links, with both the next room and world-wide, letting you obtain and manage mass information swiftly and interactively.

Unfortunately, the trade-off for such computing power is often system complexity and user bewilderment.

We can help. We provide consulting, to assist you in selecting the right configuration for your needs, as well as after-implementation support and custom software. We also have a line of general applications software to simplify handling DOS 2.0 and organizing your hard disk, so you can spend your time taking care of your business instead of learning ours.

DATAGARD[™]

A Multi-User Data Security System for DOS 2.0 and hard disk.

Datagard allows you or your "system manager" to set up a rigorous data security system. With a hard disk, capable of handling 10 megabytes of data, you can't afford to leave it unprotected.

Security - Provides complete access control over all directories, including password protection, user grouping, privilege rating with verification before execution of commands (no accidental formatting of your hard disk), and log on/log off statistics.

Convenience - Though sophisticated in function, Datagard is easy to install and, once installed, runs "invisibly" in the background, performing its operations automatically, even if you re-boot. It gives each user their appropriate directory instantly without typing in elaborate path-names.

Compatibility - Datagard requires no modification of DOS 2.0 or your 2.0 software. It can even be installed on a hard disk already in use without losing data or tediously moving files onto floppy-disks.

XT - Manager[™] (XT-M)

A library of Multi-user Management utilities for DOS 2.0 and hard disk storage.

XT-M expands upon the power of DOS 2.0 while simplifying many of its uses, allowing you to take advantage of DOS 2.0 features with single key-stroke ease-- and without having to learn a new operating system.

XT-M:Flexikey[™] - Expands and simplifies DOS 2.0 key assignment capabilities, allowing five times the normal character capacity in the assignment buffer. Assign single keys or the whole keyboard without losing work currently in memory.

XT-Menu[™] - Creates interactive line menus and custom "prompts" so that even users who have no experience with DOS 2.0 can easily handle data on the hard disk.

XT-Mail[™] - An electronic mail/echo system for easy communication between users sharing the same hard disk.

XT-M:SetFile[™] - Checks, searches for, lists and changes file-status settings (eg: hidden, read-only, system file, etc.) for easy file management and data protection within a single user directory.

We also feature STATGRAF[™], our integrated package of Statistical Analysis and Interactive Graphics for the IBM-PC and XT. It is available for DOS 1.1 or DOS 2.0 and hard disk. Both versions are data-file compatible and offer identical features.

STATGRAF's clear documentation now includes STAT-tutor[™], which uses worked examples and the STATGRAF program to teach statistical theory and applications interactively with the computer. For the beginner, or those who want a refresher.

For complete information on our services or software, circle the reader service card or contact us directly at:
Village Information, 55 Christopher St., NY, NY 10014
212-924-8314

The wheel was half of a good idea. Then someone invented the axle.

We're Cygnet™ Technologies. And what we've invented is the first Communications CoSystem for the personal computer. It does for the PC what the axle did for the wheel.

If you think about it, the personal computer is really a decision-making tool. It helps you process information faster and more effectively than you can do it yourself. But besides the processing of information, decisions also require the gathering and distributing of information.

That's where the Cygnet CoSystem fits in.

Working in tandem with the personal computer, the CoSystem increases your personal productivity by turning your PC into a truly integrated workstation. For the first time, your ability to generate information is matched by your ability to collect and communicate it.

Think of it this way...



CIRCLE 145 ON READER SERVICE CARD



The Cygnet Communications CoSystem. It's the first in an entirely new category of products. Not only can the CoSystem draw on the full resources of the PC, it can also function independently to streamline a whole spectrum of telephony, information access and voice/data communication tasks. Tasks you can't accomplish with any other combination of hardware and software. At any price.

Desk-to-desk teleconferencing. This gives you the ability to exchange both verbal and textual information between offices, buildings or cities...in seconds. The Cygnet CoSystem gets you the facts when and where you need them. Over normal telephone lines.

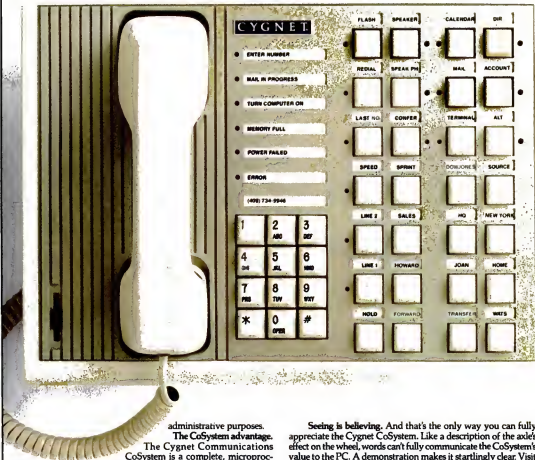
Automatic electronic mail. The CoSystem allows you to send and receive unattended electronic mail twenty-four hours a day—even with the PC off or otherwise engaged. Send memos,

even "confidential" mail, to one person or to an entire distribution list. You can also communicate with other PC's, terminals and CoSystems, plus a wide variety of computers and workstations.

Panoramic information access. The touch of a single, programmable function key can connect you to subscriber data bases or the company mainframe. Including routing through lower-cost telephone carriers like SPRINT® and MCI! Forget about log-ons, answerbacks and passwords. One key takes care of it all.

Communications management. In addition to a whole range of automated telephone functions like speed-dial, auto redial and a 400-name directory, the CoSystem's calendar reminds you of appointments and deadlines. What's more, the CoSystem automatically keeps detailed records of all voice, data and electronic mail communications for billing as well as

The other half of your PC is here.



administrative purposes.

The CoSystem advantage.

The Cygnet Communications CoSystem is a complete, microprocessor-based system with 90K of dedicated memory. It's much more than a replacement for external and peripheral devices like modems and telecommunications software. The CoSystem works synergistically with the PC to bring you tangible benefits you simply can't get with any other hardware-software combination.

Collapsing information float. By eliminating the delays of conventional communications, the CoSystem collapses the interval between questions and answers. The decision-making process becomes more responsive, because communication can take place at the speed of thought rather than the speed of mail.

Seeing is believing. And that's the only way you can fully appreciate the Cygnet CoSystem. Like a description of the axle's effect on the wheel, words can't fully communicate the CoSystem's value to the PC. A demonstration makes it startlingly clear. Visit your local computer store, and find out how your personal computer can add a whole new dimension to your personal productivity. All it takes is the Other Half of Your PC.

CYGNET

THE OTHER HALF OF YOUR PC™

Cygnet Technologies, Inc. 1296 Lawrence Station Road
Sunnyvale, CA 94089
Call (800) 331-9116 for the name of your local Cygnet dealer
Call (800) 331-9113 in California



CIRCLE 143 ON READER SERVICE CARD

Cygnet, and the Other Half of Your PC are trademarks of Cygnet Technologies, Inc. SPRINT is a registered trademark of Southern Pacific Communications Company. MCI is a registered trademark of MCI Telecommunications, Corp.

ONE STOP SHOPPING & IMMEDIATE

DISKETTES: The Best Names in the Business



Bargain-priced mystery labels are the most expensive disks you can buy. Which you already know if you have lost hours of irreplaceable work by using low-grade disks. The real value of disks is the value of the work on them, so why take chances? Buy only the best, which is all that we offer. All the following are 5 1/4", soft-sectored:

Brand	Description	Product #	Price for Box of 10
IBM	Single Sided Double Density	D1101	32.50
IBM	Double Sided Double Density	D1102	42.50
3M	Single Sided Double Density	D1501	27.50
3M	Double Sided Double Density	D1502	38.50
Maxell	Single Sided Double Density	D2001	32.00
Maxell	Double Sided Double Density	D2002	45.50
Memorex	Single Sided Double Density	D2301	28.50
Memorex	Double Sided Double Density	D2302	38.50
TDK	Single Sided Double Density	D2801	32.00
TDK	Double Sided Double Density	D2802	45.50
Verbatim	Single Sided Double Density	D3201	29.25
Verbatim	Double Sided Double Density	D3202	40.00

RIBBONS: We Outfit All the Popular Printers

No matter which of the top printers you have interfaced to your PC, we have what you need. Our low prices afford frequent changes to keep your hard copies from fading away. Don't be stranded with an overworked ribbon when that important report comes along. Always be ready to make a good impression. Order several today:

Printers	Model	Description	Product #	Price
Epson (IBM)	MX-80		R0301	9.25
Epson	MX-100		R0302	13.50
Diablo		HyType I Nylon	R1001	6.50
Diablo		HyType I Multi-Strike	R1002	5.35
Diablo		HyType II Nylon	R1003	6.90
Diablo		HyType II Multi-Strike	R1004	6.35
Qume		Nylon	R1501	5.35
Qume		Multi-Strike	R1502	4.50
NEC	8023		R2201	9.90
NEC	Spinwriter 5500-7700		R2202	5.95
Okidata	Series 80, 82, 83		R2501	3.25
Okidata	Microline 84		R2502	6.50
Radio Shack	Ricoh Daisywheel II		R3001	6.90
Radio Shack	Line Printer VI & VIII		R3002	8.90
SCM	TP-1 Daisy	12104 Multi-Strike	R3601	9.45
SCM	Wheel	12195 Nylon Fabric Black	R3602	4.45

PRINT WHEELS: Authentic Brands Mean Longer Life

Don't be misled by everyone's claims of "letter quality". Our precision-manufactured print wheels and thimbles from the top printer manufacturers guarantee you perfect quality. Their tough, wear-resistant plastic assures sharp, solid black impressions over long and rugged use. The most popular styles are listed below. Ask if you need others; we stock the full lines.



Qume Brand	Diablo Brand	NEC
Price for Each		
7.75	7.75	16.75

Type Fonts	Product #'s		
Courier 10	W1001	W2001	W3001
Courier 10A Legal		W2002	W3002
Courier 12	W1003		
Courier 72		W2004	W3004
Pica 10	W1005	W2005	W3005
Elite 12		W2006	W3006
Prestige Elite 12	W1007	W2007	
Prestige Elite Legal 12A			W3008
Letter Gothic Legal 12	W1009		
Dual Gothic Legal 12		W2010	
Dual Gothic 12B			W3011
Manifold 10		W2012	

DATA CARTRIDGES: Top Quality 3M Brand

For backing up hard disks, nothing matches the speed and density of tape streaming. These remarkable cartridges from 3M, as little as pocket size, copy enormous quantities of data in minutes; a job which can take hours using floppies. They are pre-tested, certified, and guaranteed for five years!

3M Part #	Our Product #	Price
DC 100 A	C0100	18.65
DC 300 A	C0300	24.95
DC 300 XL	CX300	28.45



Corporate Accounts Welcome: Use the accompanying card to establish credit.

DELIVERY FOR ALL YOUR SUPPLIES

LABELS: Pressure Sensitive and Non-Smearing

We have all the variations that your mailing list program might need. Easily lifted and firmly affixed for no peeling at corners, and no smudging when you press them on envelopes and correspondence. Perfect for labeling and organizing anything in your office.

Size: All labels are standard 3 1/2" by 15/16"

Style	Quantity	Product #	Price
1 across	5000	L0001	12.50
2 across	10000	L0002	21.90
3 across	15000	L0003	30.00
4 across	20000	L0004	37.50

PAPER: A Mix of Weights and Measures to Match All Your Needs

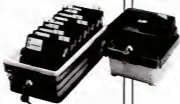
We stock full-size boxes and convenient Mini-Packs to fit all your likely requirements. "Green bar" stock alternates a horizontal half-inch pale green stripe with a half-inch of white to help the eye align along a row of printing. "Perforated" lets you tear off the vertical pin-feed holes and yields perfect 8 1/2" by 11" pages for correspondence, filing, and notebooks. 20 lb is full thickness and bright white. 15 lb is perfect for higher volume economic printing, and packs more to the inch. Use your printer for multiple copies. At little more than a penny a page, it beats the cost of photocopies!

Size	Type	Quantity	Weight	Product #	Price
Full Box					
14 7/8" by 11"	White	2500 sheets	20 lb	P1430	42.50
14 7/8" by 11"	Green Bar	2500 sheets	20 lb	P2420	42.50
14 7/8" by 11"	White	3400 sheets	15 lb	P1415	45.50
14 7/8" by 11"	Green Bar	3400 sheets	15 lb	P2415	45.50
9 1/2" by 11"	White/Perforated	2500 sheets	20 lb	P1920	32.00
Mini-Packs					
14 7/8" by 11"	Green Bar	1000 sheets	20 lb	P0420	25.50
9 1/2" by 11"	White/Perforated	1000 sheets	20 lb	P0920	19.50

DISKETTE HOLDERS: Make Extra Protection a Standard Practice

The microscopic surfaces of the best disks need all the protection you can give them. Don't risk hours of work to spills, dust, or smoke particles. Insist that your disks be stored in our sturdy plastic containers, and, as a bonus, organize your workplace.

Our Lock-Box line has a clear plastic cover and comes with two keys to discourage borrowing and unauthorized browsing. The Color-Coders make for easy classification of your categories of work. All sizes are for the PC's 5 1/4" diskettes.



Type	Capacity	Product #	Price
Lock-Box	Each box, 35 disks	V1035	44.50
Lock-Box	Each box, 85 disks	V1085	29.75
Color-Coder	Each box, 10 disks	V2001	2.95
Color-Coder	Set of 5 (5 colors)	V2005	13.95
Flip 'n File	60 disks	V3001	25.00

CLEANING KITS: Easy Preventive Maintenance You Can Perform

Mysterious read and write errors lead to costly and disruptive service calls. Avoid them by keeping the vital read and record heads on your disk drives pristine. No disassembly. Just moisten the disk with cleaning fluid, and slip it into the drive. Nothing more

to it. Works for single- or dual-sided disks. Kits include separate cleaning fluid and disks, or fluid-impregnated disks.

Brand	Product #	Price
FD-05 Kit	C1001	32.50
Verbatim Kit	C0500	10.00
" (10 extra disks)	C0510	17.25
3M Kit	C1201	28.75
Head Kit	C1501	15.75

We are your supply line. Just call . . .

1-800-722-7263

1-212-834-0170 (in New York State, use the 212 number)

. . . or fill out the order card and mail.

MINIMUM ORDER \$20.00 When ordering by phone, please have ready all the information requested on the order card.

FIRST QUALITY SUPPLIES FOR LESS
There's more than fits on these pages! For a catalog of our entire product line, tick the appropriate box on the card and mail.

PO. BOX C-773
DEPT 11-A
PRATT STATION
BROOKLYN, N.Y. 11205-9916

PC ANNEX

Introducing:

Offix™

The Personal Office System

The World's easiest to use
Software Package that integrates:

1. Filing
2. Word Processing
3. Forms Design
4. Report Generation



Imagine, a program so easy to use that it doesn't even need a user's manual! By using pop-up menus, help screens, and on-line documentation, OFFIX™ teaches you everything you need to know as you go along. All in plain English. Best of all, OFFIX™ is only \$99.00!

Ask for OFFIX™ at your local computer store, or call us toll-free at (800) 782-4896. Dealer inquiries welcome.

EMERGING
TECHNOLOGY

2031 Broadway Boulder, Colorado 80302 (303) 447-9495

Requirements: MS-DOS, 1.2MB RAM, two disk drives. Runs on IBM PC and IBM XT (and most compatible machines), TI PC, NDL, APC, DPL, Rainbow, Zenith Z 100 and Victor 9000.

CIRCLE 237 ON READER SERVICE CARD

©1988 Emerging Technology

Networking the PCs in your business provides simultaneous access to current information, but it may take some time to get the system running smoothly.

Getting The Net Working

Whether your business is a flower shop, a machine shop, or a semiconductor plant such as mine, you may find that the best way to solve your business problems is by using a local area network (LAN). Every business has problems. If time allows for a careful analysis and if the decision maker has immediate access to information from a wide range of sources, many of these problems can be solved fairly easily. Through interconnected personal computers, each of which shares hardware, data, and software for specific applications, a LAN can provide immediate information. The way your company uses its information, or data, determines whether it thrives in a particular marketplace or just gets by.

Several networks were reviewed in the August issue (see, "To LAN or Not to LAN," PC Magozine, Volume 2 Number 3). A local area network consists of two or more microcomputers that are linked over a wire cable. They usually share a hard disk and possibly hardware, such as a

printer too expensive for each PC to have individually.

Networks for larger computers already conveniently provide access to copiers, light switches, the thermostat, and even automated warehouses. But the key word

YOU MAY
*find that the best way
to solve your business
problems is by using a
local area network.*

here is conveniently. In the world of microcomputers, true networking convenience is yet to be attained, but things are moving fast. Before long your PC will be able to send the inventory report directly

to the copier, have it make seven copies, and print the names of those receiving them in the upper right-hand corner.

But don't wait until then to consider using a network in your own business. Even though networking is just a baby, the currently available networks are already paying for themselves.

Hard Disk Storage

Virtually all networks offer common high-capacity hard disk storage. In a manufacturing operation, it doesn't take long before the necessary information outgrows the storage space of several floppies. Hard disks offer not only increased storage space but the opportunity for many users to access the information at the same time. If information, say the inventory in the stockroom, could be read from a shared hard disk by everyone who needed it, things could happen fast and with greater accuracy.

Even if only one person or department is adding to the database, all users benefit

PC/FORTH™

If you want total control over your IBM® Personal Computer . . . If you are interested in graphics, games, communications, robotics, data acquisition, or process control . . . you should be using FORTH!

Compatible with PC/XT, COMPAQ, and all hard disks
Versions available for PC-DOS 1.1 and 2.0, CP/M-86®, Concurrent CP/M
Quarterly Newsletter
Inexpensive Updates
Uses memory mapped video for blinding fast displays!
NEW! Animation Support and Turtle Graphics
83-Standard Version available Sept. '83.

- FORTH is interactive and conversational like BASIC, but twenty times faster.
- FORTH programs are highly structured, modular, and easy to maintain.
- FORTH gives you direct control over all interrupts, memory locations, and i/o ports.
- Full access to DOS files and functions.
- Your application programs can be compiled into turnkey COM files and distributed with no license fee.
- Cross Compilers available for ROM'ed or disk based applications on most popular microprocessors.

PC/FORTH™ \$100.00

Includes interpreter/compiler with virtual memory and background multi-tasking, full screen editor, assembler, many demonstration programs, and 170 page manual. Upgrade to PC/FORTH+ available.

PC/FORTH +™ \$250.00

Allows creation of FORTH programs up to 1 megabyte in size. Upgrade from basic PC/FORTH available.

FORTH Cross Compiler \$300.00

Choose target microprocessor from Z-80, 8080, 8086/88, IBM PC, LSI-11, 68000, 6502, Z-8, 1802.

Programmer's Package #1 \$250.00

PC/FORTH, Advanced Graphics, Symbolic Debugger, Cross Reference Utility, and "Starting FORTH".

DEMO Disk..... \$5.00

Requires graphics card

Extension Packages

Advanced Color Graphics	\$100.00
Intel 8087 Support.....	100.00
Software Floating Point.....	100.00
Interactive Symbolic Debugger	100.00
PC/GEN™ Custom Character Sets	50.00
PC/TERM for Smartmodem.....	60.00
QTF+ Editor/Screen Formatter	100.00
Curry FORTH Programming Aids.....	150.00
Cross Reference Utility.....	25.00
Hierarchical File Manager	50.00
B+ Tree Index Manager	125.00
B+ Tree File and Index Manager	200.00

Intel 8087 Processor..... \$250.00

"Starting FORTH" tutorial..... \$16.00

PC/FORTH requires 48 kbytes RAM and 1 disk drive, Cross Compilers require 64 kbytes RAM. PC/FORTH+ requires 128 kbytes RAM. Prices include shipping by UPS or first class mail within USA and Canada. California residents add appropriate sales tax. Master Charge and Visa accepted. We also sell FORTH's for 8080, Z-80, 8086/88 (including TI Professional, Zenith Z-100, and DEC Rainbow), and 68000 based microcomputers.



Laboratory Microsystems Incorporated
4147 Beethoven Street, Los Angeles, CA 90066
Phone credit card orders to (213) 306-7412

Trademarks:

IBM—International Business Machines Corp.

CP/M—Digital Research Inc.

PC/FORTH+ and PC GEN—Laboratory Microsystems Inc.

CIRCLE 276 ON READER SERVICE CARD

from having current information. If several users are adding to or changing the information independently of the others, networking is almost a necessity.

In a LAN several users can share the cost of expensive hardware and software. If one user needs a letter-quality printer capable of feeding letterhead sheets, other users can benefit from the printer, too. These two reasons alone—hardware-sharing and simultaneous access to a database—may justify the economics of linking your PCs into a network.

TELMOS' Omninet

TELMOS, Inc., has had Corvus' Omninet installed for 2 months. The net was bought to provide general office management capabilities, not to be the ultimate manufacturing control system for its semiconductor manufacturing operations (although several promising applications currently are being considered in this area). TELMOS has 50 employees and a network of five IBM PCs, which is more than large enough for the 15 employees who use it regularly.

The five PCs, each with a color monitor and a printer, share a 20-megabyte Corvus hard disk. Four of the PCs have Epson MX-100 dot-matrix printers; the other has a letter-quality Diablo 630 printer with a cut sheet-feeder option.

Each computer is equipped with 128K RAM, which is adequate for all but one application. Generating spreadsheets with Lotus' 1-2-3 requires additional memory.

Four PCs were assigned to specific areas: manufacturing, finance, marketing, and production control; the fifth is reserved for general use.

The network has been installed for only a short time, and, at present, is being used at a fraction of its capabilities. Network applications are being considered by each department, and as these are brought on line, system use will increase.

One of TELMOS' major network applications provides access to all the company's released documents and is managed through a nonlinear combination of word processing (WordStar 3.3) and database management (Condor 3.0). This system extends far beyond the usual indexing of documents by number, title, and so forth. Condor structures the information for convenient use, so each of the departments can have an index tailored to its specific requirements, which can be called up as

needed. All departments have access to all the indexes, but, for the most part, each department uses only its own.

Each of the semiconductor devices TELMOS makes can be sold in a variety of packages. Next time you take the cover off your PC and look, you will see several of the package styles available to a semiconductor manufacturer. Each has a specific purpose; plastic or epoxy packages are less expensive than ceramic ones, but the more expensive packages are more reliable and more resistant to humidity. Each package requires detailed assembly instructions with drawings, including such information as the type and size of interconnection wires used, the attaching medium for the die, the die size, the number of leads, the width of the package, and

so forth. All this information must be cross-referenced to stock numbers and supplier's part numbers.

Each of the major departments in the company is interested in only a portion of the total information at any one time, but all the information must be immediately accessible and absolutely current. The marketing department may need a listing of all packages in which every product is currently available. This listing is an electronic copy of information contained in the database. Marketing's information is identical to the information in any other department. This is the point of the network: It generates the same information to any number of sources.

Other departments are interested in totally different summaries from the same

Restoring WordStar's Color Border

A short program to solve one problem that occurs when using WordStar in a network.

If two or more users share WordStar 3.3 on a network, they all must use the same color selection and the same definition set for the ten function keys. If two users like magenta letters on a red background, you're stuck with them too, unless you do the choosing. One way around this problem is to get your own copy of WordStar, but that defeats the purpose of the network.

In WordStar 3.3, you can have any color of border so long as it's black. WordStar turns off the border color no matter what you and your fellow network users decide.

From within WordStar, however, you can run a program from the main menu by entering the command R followed by the name of the program. Using this feature, you can run a short BASIC program to turn the border color back on and each of you can choose your own color for the border. Here's how.

First call BASIC and enter this short program:

```
100 COLOR 7,1,2
110 CLS
120 SYSTEM
```

This gives you (temporarily) white letters, blue background, and green border, a

much better choice than magenta and red. Or choose your own colors according to the instructions in the BASIC manual.

Save this program under the name BORDER with the command:

```
SAVE ' ' d: BORDER
```

Use the drive where you want BORDER saved instead of d:.

Now whenever WordStar comes up in living color minus the border, you can set the border color from the main WordStar menu:

```
Press:
Enter:
Press:
```

```
R
d: BASIC
Enter
```

```
d: BORDER
```

(d: is the drive designator where you have BASIC and BORDER stored.)

Watch the magic show!

When WordStar says, "Press any key to return to WordStar," press the space bar or whatever and you have WordStar with your border color still turned on!—J.F.C.

database. Production control can determine all the devices using a 24-lead ceramic dual-in-line package, for example, adjusting its stock levels according to expected usage. The summary of usage by package type can be made directly by production control on the identical information used by marketing or engineering. Neither department needs to know that the information is being accessed at the same time by another user, but all can be confident that the information is current and accurate.

Unfortunately, getting the network up and running is not painless. Microcomputer networks may be more painful than most, although the end result is probably worth the effort and cost required to make the net work.

Documentation

Most of the documentation that came with Omninet and the individual software packages was either incomplete or, as someone said, "written for a compulsive problem solver." One of the manuals that

came with the system contains cartoons, but its attempts at humor fell very flat when you can't get your system working. If you buy a network now, be prepared to spend more time than you thought you would figuring out the system; the manuals won't be much help.

Software

Many of the applications programs currently available to network users have a number of minor problems. For instance, some programs actually turn the color display off when you have it set to on. The new WordStor turns off only the border color; there is a way to turn it back on, but it's inconvenient. Many of the network versions of widely used applications are not yet fully debugged. Also, networks are not yet capable of some sophisticated tasks. For instance, interrupting another computer on the network to pass information to its user and expecting that computer to resume its former task cannot be done, at least not safely. But all these things will come. What is needed now is a

clear understanding of the network's capabilities to tell potential users so they don't get discouraged and revert to erasers and carbon paper.

The first end reel giant step toward accomplishing this goal is the manual by Dennis Kemmerer written for the BUSINESSLAND Office Automation System. This manual is the finest piece of technical writing that I've seen to date for the microcomputer field. Without it, the network would be difficult to understand at best. BUSINESSLAND recognized that Corvus' Omninet is inconvenient to use and designed a software package that oversees the network; it is a supervisor program that provides menus to invoice the network's operations.

Overall, local area networks can be a worthwhile investment with immediate rewards, but they are costly, both in capital investment and time required to get them operating. The warranty will be slipping away and the shine will be well worn off the hardware before you will be able to say for sure, "The net works." /PC

Atron Announces A State of the Art Advance in Software Debugging...

PC PROBE

Software productivity is your biggest problem. PC PROBE is your best solution. Now you can cut your PC program development time down to size with the most advanced software (or hardware) development tool available. The PC PROBE plugs into any IBM PC or equivalent. This tool solves all of the most difficult hardware and software problems with these features:

REAL TIME TRACE — eliminate annoying print statements
HARDWARE BREAKPOINTS — trap any program operation you can think of
HIGH LEVEL LANGUAGE COMPATIBILITY — simplify high level language debug
SYMBOLIC DEBUGGING USING PROGRAM SYMBOLS — no more absolute values
PROGRAM CRASH RECOVERY — no more powering down the system
ENHANCED HUMAN INTERFACE — no more cryptic commands
MACRO COMMAND DEFINITION — no more debug command limitations
PROGRAM PATCHING WITH HIGH LEVEL LANGUAGE LIKE COMMANDS — no more Assy.

PC PROBE is available now so don't waste any more time with primitive debugging techniques — call us today for more information (408 — 741-5900).



2065 FOURTH STREET
SARATOGA, CA 95070

CIRCLE 141 ON READER SERVICE CARD

PC MAGAZINE 226 NOVEMBER 1983

Introducing the Winning Line-Up From Berzurk Systems

Spell-It™, "the best buy in the market today," is
joined by 3 new rising stars.

Spell-It™

SPELL-IT™, the "star" of the show, adds new features and versatility, including a new function allowing you to scan the main dictionary of 41,000 words. SPELL-IT™ helps you correct your spelling errors and typos with the push of a key, even if you're not sure of the spelling. SPELL-IT™ assists you in finding the right word; creating up to 10 of your own auxiliary dictionaries and allows you "in-context" editing to correct your mistake while viewing the sentence in which it occurs. Compatible with WordStar, EasyWriter 1.1, Volkswriter, PeachText and most other word processors.

\$49.95

80 column display, 2 drives,
64K, DOS 1.1 or 2.0
Meet 3 new rising stars from
Berzurk Systems...

ReKey™

Now, with ReKey™ assign any of the special function keys on the IBM keyboard to any other command or series of commands. Reconfigure your word processor to work the way you want it to with ReKey™! ReKey™ is always on line, with friendly menus assisting you in your key reassignments, even when running other programs! Multiple key buffers allow you easy customizing of your keyboard for different programs.

\$49.95

40 or 80 column display,
1 drive, 64K, DOS 1.1 or 2.0

PhantomDisk™ PhantomPrint™

With PhantomDisk™ you'll use the memory capacity of your IBM to its fullest by creating up to 8 different electronic ram drives. PhantomDisk™ allows you to run programs from memory instead of from disk, speeding up almost every operation dramatically.

\$49.95

80 column card, 1 drive,
96K, DOS 2.0

PhantomPrint™ eliminates the long waiting normally associated with printing by buffering your printer output in memory. PhantomPrint™ also allows you to save printer output to a file for later editing.

\$49.95

40 or 80 column display,
1 drive, 64K, DOS
1.1 or 2.0

BERZURK SYSTEMS

1434 Parker Street, Berkeley, California, 94702

BERZURK SYSTEMS TOLL FREE 24 HOUR ORDER LINE
CA dial 800-772-3545 ext. 201 · 800-227-1617 ext. 201
VISA and MC orders only



BERZURK TECHLINE (assistance and dealer inquiries)
415-845-9462, 9 am-5 pm (PST)

All programs function with IBM-PC, IBM-XT and most look-a-likes. SPELL-IT also available for CP/M-80. Requires 80 x 24 cursor addressable terminal, 2 drives, 56K, CP/M 2.2. Also available on the following formats: Osborne Executive, NorthStar, Televideo, Single Density 8", Micro Decision, Osborne-1, Apple Softcard, Osborne-1 and Apple Softcard versions are supplied with only 31,000 words. SPELL-IT, ReKey, PhantomDisk and PhantomPrint are trademarks of Berzurk Systems.

Spell-It

BERZURK
SYSTEMS

ReKey

BERZURK
SYSTEMS

PhantomDisk

BERZURK
SYSTEMS

PhantomPrint

BERZURK
SYSTEMS

CIRCLE 146 ON READER SERVICE CARD

IBM, WordStar, and CP/M are registered trademarks of International Business Machines, Micropro International, and Digital Research respectively. EasyWriter, PeachText, Volkswriter, are trademarks of Information Unlimited Software, Peachtree Software, and Lifetime Software respectively.

Plain talk about printers...

Dot Matrix Printers

There've been big changes in IBM PC printer compatibility. Okidata's new Plug-n-Play ROMs (see below) make a Microline 92 or 93 fully compatible with PC screen graphics. We expect that other printer manufacturers will offer similar upgrades shortly.

EPSON

FX, RX & MX



The **FX-80** (160 cps) has a correspondence font, 10, 12 & 17 cpi, italic, double-strike/width/ emphasis & dot graphics, plus a 2K buffer. Friction & pin feed is standard; the adjustable tractor is optional & cost extra. The **FX-100** is the 136 column version & includes the adjustable tractor. The **RX-80 & RX-80 F/T** (100 cps) are upgraded versions of the MX Series.

RX-80.....	\$399.99
RX-80 F/T.....	\$499.99
MX-100.....	\$999.99
FX-80.....	\$599.99
FX-80 Tractor.....	\$399.99
FX-100.....	\$749.99

C. ITOH

Prowriter



C. Itoh's **Prowriter** has speed (120 cps), a buffer (1.5K), 10, 12, & 16 cpi (plus a proportional font with correspondence quality) and dot graphics (160x144 dpi). One of our biggest sellers, the **Prowriter 2** has the same specs, but in a 136 column format.

Prowriter.....	\$399.99
Prowriter 2.....	\$719.99

STAR MICRONICS

Gemini 10X/15 Delta 10/15



The **Gemini 10X** (120 cps) features 10, 12, 17 cpi, italic, a correspondence font, 120 x 144 dpi graphics matrix & a 1K buffer. The **Gemini 10X** comes with friction/tractor feed & uses plain spool ribbons. The **Gemini 15** is the 132

column version, & it has a proportional font.

Star's **Delta 10** features both parallel & serial interfaces, 180 cps print speed, an 8K buffer, plus the standard fonts (10, 12 & 17 cpi), dot graphics, friction/tractor feed and spool ribbons. The **Delta 15** is a 136 column version.

Gemini 10X.....	\$399.99
Gemini 15.....	\$499.99
Delta 10.....	\$599.99
Delta 15.....	\$CAll

OKIDATA

Microline Series



The **Microline 92** (80 cpi) & **93** (132 cpi) are ideal for word processing. They offer a 160 cps draft mode, a 40 cps correspondence mode, 10, 12 & 17 cpi (w/double-width), pin/friction feed (tractor is optional on the 92) & dot-addressable graphics (120 x 144). Centronics parallel interface is standard; the serial (RS-232C) interface is optional.

A new PROM called **PC Plug-n-Play** turns a 92 or a 93 into an IBM printer, with full screen dump capabilities. You will sacrifice a few features (like 12 cpi) but the PROMs are worth it if total compatibility is your goal.

The **Microline 92A** (50 cpi) & **93A** (132 cpi) are data crunchers, period. They print 120 cps, at 10 & 16 cpi (5/8 double-width). Dot-addressable graphics are optional.

The **Microline 94** (132 cpi) is the Step 2 version, featuring 200 cps at 10, 12 & 17 cpi (w/double-width), all with a correspondence mode & dot addressable graphics. Parallel or serial (RS-232C) interfaces available.

Microline 92A.....	\$399.99
92A/92 Tractor.....	\$599.99
Roll Paper Holder.....	\$49.99
92A/93A Kitgraph 1.....	\$999.99
Graphics ROM.....	\$49.99
Microline 92.....	\$499.99
92/93 IBM-PC Plug-n-Play.....	\$799.99
Graphics ROM.....	\$49.99
92/93 RS-232C interface.....	\$99.99
Microline 94.....	\$1024.99
w/RS-232C interface.....	\$1139.99

DIABLO

Series 32

Diablo has now entered the dot matrix printer market, and their new **Series 32** (150 cps) looks very promising. It features 132 column, with 10 or 16 cpi, plus a near-letter quality font. It has all the sub/superscripting features you'd expect, plus both dot & block graphics. We can't tell from the spec sheet, but we assume the **Series 32** is Diablo compatible.

Series 32.....\$CAll

MANHESMANN TALLY

MT-160 L MT-180 L Spirit



The **MT-160 L** (160 cps) is a sharp printer. The 10, 12, 17 & 20 cpi, plus correspondence font, makes the **MT-160 L** very versatile. It has both parallel & serial (RS-232C) interfaces, and the menu-driven installation from the control panel is easy to use. Friction and adjustable tractor feed are standard issue. The **MT-180 L** is the 136 column version.

The **Spirit** (80 cps) is Tally's new, low cost draft printer. It has 10, 12 & 17 cpi fonts, friction & adjustable tractor feed, and a unique square-wave printhead that makes even draft printing a pleasure.

MT-160 L.....	\$975.99
MT-180 L.....	\$949.99
MT-Spirit.....	\$329.99

Other Dot Matrix Printers:

Anadex.....	\$1499.99
DP-9620.....	\$1539.99
DP-9625.....	\$1899.99
WP-8000.....	\$2279.99
IDS.....	
Prism 80.....	\$1079.99
w/4-color.....	\$1439.99
Prism 132.....	\$1239.99
w/4-color.....	\$1899.99
MicroPrism.....	\$999.99
Informant.....	
Riteman.....	\$349.99

Letter-Quality Printers

This new, low-speed letter-quality printers are making quality affordable. And the high-speed models are coming down in price too. Still, get a dot matrix printer for drafts & as a backup.

C. ITOH

StarWriter PrintMaster



The C. Itoh **StarWriter** (40 cps) offers top speed at a good price. It uses Diablo code, wheels & ribbons, 10 or 12 pitch, 8, 8 1/4" & 11 1/4" line space, plus 1/120" horizontal spacing—ideal for proportional modes. We've found the **StarWriter** exceptionally reliable. The **PrintMaster** has the same specifications, but prints at 55 cps.

StarWriter Parallel.....	\$1219.99
PrintMaster Parallel.....	\$1599.99

SILVER REED

EXP-550/500



The Silver Reed **EXP-550** (17 cps) is a 132 column letter-quality printer with 10, 12 or 15 pitch, sub/superscript, underlining and true Diablo 1810 emulation, making it compatible with most word processing software. It's friction feed, and it features a page injector, and an optional tractor is also available.

The **EXP-500** (12 cps) is a 100 column letter-quality printer with the same specs as the **EXP-550**, but slower and without page reject or a tractor.

EXP-550 (Parallel).....	\$999.99
EXP-550 Tractor.....	\$1399.99
EXP-500 (Parallel).....	\$499.99

NEC

Spinwriters

The new **2000 Series** are slower (20 cps), but they've retained all the quality of the 3500/7700 Series. Uses the same ribbles & ribbons.

2010/2030.....	\$1049.99
2050.....	\$1199.99
3530.....	\$1799.99
3550.....	\$2099.99
7710/7730.....	\$2299.99

SMITH-CORONA

TP-1 Messenger



The **Memory Correct III Messenger** (the full name) is ideal for the home or small office. It combines the features of an electric typewriter and a letter-quality printer. It features 12 cps, 3 pitches (10, 12 & 15), variable line spacing, 10.5" writing line, backspacing & auto-correction. It comes complete with parallel/serial interface.

The **TP-1** has fixed pitch (10 or 12 cpi) & underlining, but cannot sub/superscript. The tractor feed is optional. (Specify 10 or 12 cpi when you order.)

Memory Correct III.....	\$929.99
-------------------------	----------

TP-1.....	\$499.99
TP Tractor.....	\$139.99

Other Letter Quality Printers

Comma.....	
CR-1.....	\$849.99
CR-2.....	\$999.99
Diablo.....	
620 (RS-232C).....	\$999.99
830 (PC).....	\$1979.99
Dume.....	
Sprint 11+.....	\$1939.99

Monitors

USI

Pi Monitors



The **PI-3's** 20MHz bandwidth and sharp, clear phosphor make it our favorite. Comes in 9" or 12", in green.

PI-3 (12" amber) \$199.99
PI-3 (9" amber) \$199.99

NEC

JB 1205M

A close second to the USI PI Series. 18-20MHz bandwidth and a crisp, clear amber display (or green).
JB1205M-A (12" amber) \$179.99
JB1201M (12" green) \$179.99

PRINCETON GRAPHICS

HX-12



The **HX-12** is one of the highest resolution RGBs available. 16 colors (using NEC's tube), 890 dots by 240 lines (480 non-interlaced) & 15MHz bandwidth. The case is identical to IBM's, & it comes with its own cable.
PG5 HX-12 \$499.99

QUADRAM

QuadChrome

The **QuadChrome** has the same spec's as the HX-12. Same price too.
QuadChrome \$999.99

QUADRAM

QuadColor

Supports RGB or composite display, up to 480 non-interlaced RGB output.
QuadColor \$CALL

USR

Multidisplay

Supports 32K graphics, with composite, RGB, monochrome display and a parallel port.
Multidisplay \$999.99

TECMAR

Graphics Master

192K for RGB or composite display, supporting 480 non-interlaced RGB output.
Graphics Master \$379.99

COLUMBIA

DATA PRODUCTS, INC.

We are now offering both the **Columbia MPC** and the **Eagle PC-2** to our customers. These machines are IBM PC compatible, with 128K RAM on board, two 320K disk drives, one parallel port, two RS-232C ports and bundled software packages.

The **Eagle PC-2** includes MS-DOS, CP/M 86, plus Eagle-Writer and EagleCalc. The **Eagle PC-2** also includes a monochrome monitor, with a resolution equal to the PC monitor. The **PC-2's** ideal for first-time users. It's easy to learn & easy to use.

The **Columbia MPC** includes MS-DOS, CP/M 86, BASICA, Perfect Writer/SpellCalc/File Home Accountant Plus, Fast Graphs, Aynch Comm, a Macro Assembler, plus numerous utilities. This system is for more sophisticated users who have a PC at work and want a system at home or in a remote location.

Please call (603) 881-9855 for further specifications, price and delivery.

EAGLE COMPUTER

Modems

DC HAYES

Smartmodems

The **Smartmodems** are originate/answer, auto dial/answer, full/half duplex modems. There are two external modems (300 & 300/1200 baud) & the **1200B** (300/1200 internal for the PC). Modular phone cable & power supply included. (RS-232C cable is optional).
Smartmodems
300 baud \$219.99
300/1200 baud \$239.99
1200B w/Softcom II \$499.99

US ROBOTICS

Password

The **Password** is an originate/answer type modem. 0-300 & 1200 baud capability with auto dial/answer, auto mode/speed select, full/half duplex (local echo), audio phone line monitor. Comes with an RS-232C cable (specify male or female DB-25), power supply & modular telephone cable.
Password \$79.99

STANDARD MICROSYSTEMS

M-Term \$79.99

Peripherals

AST RESEARCH

MegaPlus II

The **MegaPlus** has one RS-232C port, a parallel port, a clock & up to 256K RAM. An optional game and second serial port are also available. Comes with SuperDrive/Spooler software.

The **MegaPlus** is a 126K or 256K piggy-back card that attaches to the MegaPlus & gives you additional memory to 256K.
MegaPlus
256K MegaPlus \$309.99
126K MegaPlus \$329.99
256K MegaPlus \$329.99
RS-232C Port \$49.99
Game Port \$49.99

AST RESEARCH

SixPak Plus

The **SixPak** holds up to 384K on the board. Added to a 256K motherboard, you've got 640K, the maximum addressable memory. **SixPak** has an RS-232C port, parallel port, clock & SuperDrive/Spooler software. An optional game port is also available.
SixPak
64K SixPak \$299.99
256K SixPak \$499.99
384K SixPak \$499.99
Game Port \$49.99

AST I/O Plus II

The **I/O Plus II** has one parallel port, one RS-232C port, one game port & a clock. A second RS-232C port is optional.
I/O+ \$199.99
ConnectAll \$CALL
RS-232C Port \$49.99

QUADRAM

Quadboards



The **Quadboard** has an RS-232C port, a parallel port, a clock & memory up to 256K (you can also get your **Quadboard** "naked," with no memory installed). **QuadSpool/Drive** software is included with every **Quadboard**, along with a one-year warranty.
Quadboard
Quadboard 0K \$219.99
Quadboard 64K \$279.99
Quadboard 256K \$429.99

QUAD 512+

Quad 512+ have a single RS-232C port on them, and sockets for up to 512K RAM. **QuadSpool/Drive** software is included.
Quad 512+ (64K) \$239.99
Quad 512+ (256K) \$439.99
Quad 512+ (512K) \$679.99

Single Function Cards

Parallel Card w/cable \$99.99
RS-232C Card \$99.99
Clock/Calendar Card \$99.99

QuadLink

QuadLink lets you run Apple II/III+ software on the PC. It's like an Apple computer on one board, with 64K. You can use all PC I/O's and color/graphics video. There's no disk conversion, no reformatting, and no fuss. **QuadLink** takes up only one slot. Specify IBM PC, Columbia MPC or Compaq computers when you order.
QuadLink \$499.99

Disk Drives

TANDON

Disk Drives

Tandon a **TB-100-2**, at 320K storage, is still holding its own. We've used them exclusively for a year now and will continue to do so.
Double-sided \$239.99

MAYNARD ELECTRONICS

Disk Controller

Perfect for bare-bones configurations. Handles two internal floppy disk drives (A & B), plus two externals.
MFD Standard \$199.99

Hard Disks

12Mb Hard Disk \$2099.99
20Mb Hard Disk \$2339.99
26Mb Hard Disk \$2509.99

Hard Disks w/Tape Backup

12Mb Disk/Tape \$2919.99
20Mb Disk/Tape \$3339.99
PC interface \$130.99

Information/Orders:
(603) 881-9855

Prices/Orders Only:
(800) 343-0726

No Hidden Charges:

We pay UPS ground shipping on all our orders, and we **never** charge extra for credit cards. We accept CODs (\$10 fee per order), payable, with a certified check, money order or cash. We have a \$50 minimum order. Personal checks are cleared in 3 weeks.

All our equipment is shipped with all manufacturer's warranty. We are an authorized dealer for all products we sell to insure full warranty support, & we're authorized for warranty work on a number of printers. We also offer extended warranty plans for most printers. Sorry, we cannot accept open POs or extend credit/terms at these prices. APO and foreign orders are not accepted. We prepared this ad in September & prices do change, so call to verify them.

Our Computer Showroom, located in Amherst, New Hampshire, is now open.



HIGH TECHNOLOGY AT AFFORDABLE PRICES

THE BOTTOM LINE



MILFORD, NH 03055-0423 □ TELEPHONE (603) 881-9855

Gen Tech

HAPPY HOLIDAY SPECIALS

OTRONA ATTACHE.....	\$2595
BASIS 108 128K CP/M 3.0...	\$1999
PROWRITER I.....	\$369
PROWRITER II.....	\$659
EPSON FX-100.....	\$725
RANA ELITE I.....	\$245
RANA ELITE II.....	\$380
RANA 1000 (FOR ATARI).....	\$309
BUFFERED GRAPPLER	
16K.....	\$179
32K.....	\$199
64K.....	\$239
MULTIPLAN IBM, Apple II/IIe	\$169
IBM PC OS00 Drive	
RANA.....	\$299
QUENTIN.....	\$275
FOURTH DIMENSION.....	\$275
LOGO	
Terrapin.....	\$119
Krell.....	\$85

CUSTOMER SERVICE & TECH. SUPPORT

401-274-0330

Ask for New Catalog.

ORDERS ONLY

800-843-4302

150 Broadway, Suite 2212, N.Y. NY 10038

Money Order, Cashier's Check, Personal Check,
C.O.D. Honored. Add 1% on Credit Card.



COMPUTERS

FRANKLIN	
ACE 1000 w/color.....	\$799
ACE PRO System	
ACE 1000 w/color, ACE 10 Drive,	
80-Column Card, ACE Winter II,	
ACE Calc (80-Col. Spread Sheet)	\$1295
ACE 1200 (128K, Dual Processor,	
1 Drive, 80-Col. DBASIC,	
CP/M & DOS	\$C all
ACE Office Management System	
ACE 1200 w/2 Drives, I/O Card,	
WordStar, MailMerge, ACE Calc	\$C all



COLUMBIA	
128K RAM, Dual (DSDD) (540K) Drives,	
Fully IBM Compatible	\$2649
w/Supersack	
128K RAM, 10 MB Hard disk	
w/Supersack	\$3950
Portable VP w/Supersack	\$C all
COMPUPO	
CORONA PC & Portable PC	\$C all

DIGITAL EQUIPMENT CORP	
Rainbow 100	\$C all

EAGLE	
PLUS 128K RAM w/2 Drives	\$C all
(540K)	
PC-XL 128K RAM 1 Floppy,	
10 MB Hard	\$C all



KAYPRO	
KAYPRO II 84K w/Software	\$1399
KAYPRO IV, KAYPRO 10	\$C all
IBM Compatible 128K or 256K	\$C all

MORROW DESIGNS	
MD2 84K, 2 3300 Drives	\$950
MD3 84K, 2 DSDD Drives	\$C all

PDS PAPER	
3865	\$995

SANYO SBC	
Victor 8000 (128K, 1 2MB Disk)	\$2700

PLOTTERS

BARSON & LOMB	
DMP 40	\$879
DMP 25 (8 COLOR 11x17 PAPER)	\$1995
DMP 40 (SINGLE PEN 22x17 INCH)	\$2599

FOR APPLE II/IIe, Franklin Ace

Fourth Dimension Super Drive	\$219
80-Col. w/RAK (16 Only)	\$209
8K RAM	\$49
8K CP/M Card	\$29
8K Dispatcher	\$109
MicroSoft SoftCard	\$225
Grapple +	\$119
Graphite	\$95
Plano card	\$129
Microtek Duplicating (8K)	\$99
Microtek Duplicating (16 18K)	\$149
CPD Surge Protectors	\$C all

FOR IBM PC

AST RESEARCH INC.	
MEGA PLUS	
84K w/Serial & Clock/Cal	\$279
128K \$379, 182K \$449, 256K \$489	

84K w/Ser. Par & Clock	\$379
128K \$439, 182K \$499, 256K \$549	
MEGA PAK 256K Module	\$299

COMBO PLUS	
84K w/Serial & Parallel	\$279
128K \$389, 182K \$449, 256K \$489	

I/O PLUS	
Serial \$30, Parallel \$36, Game \$36	\$129

QUADRAM	
QUADBOARD	
84K	\$260
256K	\$419

BI++ EXPANSION BOARD	
Dual 32+ (84K)	\$219
Dual 32+ (256K)	\$399
Dual 32+ (512K)	\$639

QUADLINK	
MICROFASER	\$489

P/P (Parallel/Parallel)	
8K \$125, 64K \$195, 128K \$309	
256K \$345, 512K \$699	
S/P P/S, S/S	
8K \$145, 16K \$165, 32K \$195, 64K \$229	
16 Power Supply	\$19.99

HARD DISK



COMDEX	
COMPILER 10 MB FOR QX-10	\$1095

CORVUS	
8 MB	\$1895
10 MB	\$2695
20 MB	\$3495
40 MB	\$4295

XCOMP	
10 MB	\$1895
16 MB	\$2095

DOT MATRIX PRINTERS



EPSON	
FX-80	\$349
MX-80 F/T II	\$419
MX-100	\$469
FX-80	\$535

STAR MICROCHICS	
GERMANI 80	\$309
GERMANI 101/105	\$419/\$479

ORION	
MICROLINE 82	\$449
MICROLINE 83	\$479
MICROLINE 84 P	\$979

C-ITON	
PROWRITER I	\$399
PROWRITER II	\$699
PROWRITER 8000 BP	\$995

MAMMERSMAN TALLY	
MT150L (160 CPS)	\$915
MT 180L (15" Carriage)	\$845

INFO RUNNER RITEMAN	
84K	\$C all

TOSHIBA P1350	
84K	\$1545

LETTER QUALITY PRINTERS



C-ITON	
F-10 STARWHEEL	\$1199
F-10 PRINTMASTER	\$1589

COMDEX	
COMITER I (P or S)	\$799
COMITER II Parallel	\$479
COMITER II Ser (S)	\$599

BAUFWITER	
2000 EXP (4MB BUFFER)	\$1019
JUNKI (16 CPS 10")	\$935

NEC SPOWRITER	
QUICK SPIRIT 10/40	\$C all

EXP 5500	
EXP 5500	\$839
EXP 5500	\$879
EXP 5500	\$439
EXP 5500	\$499

TRANSTAR T135, T132, T130 & T140	
\$C all	

MONITORS



AMDEK	
3000	\$C all
COLOR I	\$C all
COLOR II	\$359

COMDEX	
QUADCHROME (RGB FOR IBM)	\$489

TULAR	
RGB VISION I	\$275
WITH APPLE II+ CABLE & INTERFACE	\$345

RGB VISION II	
RGB VISION II	\$319
RGB VISION II (green)	\$125
RGB VISION II (12" amber)	\$135

IBM P-1 (15" green)	
\$89	

TERMINALS



Freedom 100 (11 FTN Key green)	
\$499	

Visual 50 Detachable KYBD	
\$549	

Televideo 90+	
\$565	

Televideo 925	
\$725	

Televideo 350	
\$945	

MODEMS

ANCHOR	
MARK I	\$C all
MARK VII	\$C all

HAYES	
MICROMODEM II	\$275
SMARTMODEM (300 BAUD)	\$200

SMARTMODEM (1200 BAUD)	
\$509	

SMARTMODEM 1200B for IBM	
\$439	

SMARTMODEM II (TERMINAL PROG)	
\$89	

MINITON	
CAT 300 BAUD Acoustic	\$144
C-CAT 300 BAUD Direct	\$155

J-CAT 300	
\$109	

APPLE CAT II	
\$269	

212 APPLE CAT II	
\$375	

103 SMART CAT	
\$179	

103/212 SMART CAT	
\$419	

SSM	
300 BAUD MODEM CARD	\$239
1200 BAUD MODEM CARD	\$579

TRANSENO V2/3	
\$89/\$109/\$209	

US ROBOTICS	
SPSWORD	\$C all
VEN-TIL	\$C all

SOFTWARE	
FOR IBM PC SOFTWARE	
IUS AIR A/P G/L I/O EYE	\$399
ANY THREE	\$975

FOR MSB RAINBOW AND APPLE II	
FEARLESS G/L AIR A/P I/C	\$499
PAYROLL	\$499

The investment world has altered its view of Big Blue's stock since the PC burst upon the scene. But there's more to IBM's success than the popularity of its little beige box.

IBM's Post-PC Image

Among the multitude of miraculous powers attributed to the IBM PC, notably absent is the capability to restore lost youth. Although playing its best games may make you feel younger, and its business-software applications might prevent a few gray hairs, the PC can neither chase away your wrinkles nor erase years from your birth certificate.

On the other side of the sales counter, however, some magic elixir has restored the sparkle to at least one tired old gentleman. According to many leading business reports and analysts, the PC has indeed become a financial fountain of youth that has revitalized middle-aged IBM.

A look at the figures, pre- and post-PC, offers a compelling argument for the restorative effect the PC has had on IBM. Before the introduction of its personal computer, IBM was languishing on Wall Street. Its stock was stuck in the 50s and 60s, and the bottom line on the 1979 financial statement showed the first decline in earnings in 30 years, from \$5.32 to \$5.18 per share. The next year brought marginally better numbers, \$8.10 per share, but in 1981 IBM retreated again to \$5.65 (unadjusted). Investors and analysts wondered why the fortunes of one of their favorites had faltered.

Just a little more than 2 years ago, the word on the company wasn't good. *Financial World* went so far as to ask, in a May 15, 1981, story, "What Ails IBM?" On July 15, 1981, *The Wall Street Journal* portrayed IBM as a "dull performer." From a mid-1970s price/earnings ratio of 20—near the top of the list—IBM dropped to a 10 multiple over the next 5 years—little better than the market average. After 30 years of growth at an amazing 20- to 22-percent rate, the whiz kid of the 50s and 60s had suddenly become a doddering old codger—his front-runner status reduced to that of another market also-ran.

Enter the PC, and 2 years later the stock had climbed nearly two and a half times in value, beyond 120. In early 1982, 5 months after the introduction of the PC, IBM projected that long-range earnings would nearly double by 1984, to \$10 per share or more. The 1982 balance sheet showed earnings up sharply, to \$7.39, and estimates for this year approach \$8.50 or \$9. Clearly some magic has been at work.

A Drop in the Multibillion-Buck Bucket

It's tempting to credit much of the turnaround to the little box that couldn't even

add correctly when it was released. Financially, however, the PC is only a small part of the IBM picture, and personal computer sales make up only a fraction of IBM's total revenues. According to stock market and computer industry analysts, the PC's performance has little direct financial effect on its giant parent.

"IBM has done very well financially over the last few years but not necessarily because of the PC," noted Esther Dyson, personal computer industry watcher and president of Rosen Research, publisher of *RELease 1.0*.

"The introduction of the PC and the rise of IBM is not a direct cause-and-effect relationship. A lot of people have underestimated IBM's prowess in other areas," observed Jonathan Fram, IBM analyst for Paine Webber Mitchell Hutchins, Inc. "Early on, the company recognized the strength of foreign competition, Japan particularly, and it took definite steps to free up its thinking."

"Certainly the PC has affected IBM on a number of levels. It has produced an unforecasted revenue windfall. The company has sold more units than it envisioned at the inception of the program," he admitted, estimating that the PC's share of IBM's 1983 income will be about \$1 bil-

lion, and \$2 billion to \$3 billion in 1984. "But with a company the size of IBM [estimated 1983 income is about \$30 billion to \$40 billion] that additional revenue is not enough to take the stock from 50 to 120."

The sales success of the PC has not been the only good news to contribute to IBM's renewed vigor on Wall Street. Most PC users are aware that the complete IBM product line includes a number of items besides their beloved personal computer—like mainframe computers, which account for more than half of the machines sold in the United States today. IBM's largest computer, the 3081 mainframe, also was well received. As with the PC, orders for it have stacked up faster than they can be filled.

Much also has happened to IBM outside the new-products arena in the last 2 or 3 years. Notably, the federal government dropped a 13-year-old antitrust suit against the corporation. IBM's share of the mainframe-computer market had dwindled from 70 percent to a mere 62 percent,

***E**XPERTS predicted that the good news about the antitrust suit would send the price of IBM certificates soaring. It didn't.*

and the government felt that the company no longer dominated the industry. When the settlement was announced, on January 8, 1982, five months post-PC, experts predicted that the good news about the antitrust suit would send the price of IBM certificates soaring. (Headline in The New York Times on the morning after the announcement: "Rise Seen for Stock of I.B.M.") It didn't—at least not immediate-

ly—but many analysts believe the suit settlement led IBM to develop new, more aggressive pricing policies.

Less than a year before the personal computer was unveiled, new IBM president and chief executive John R. Opel took the corporate helm. Under the new skipper, IBM departed from corporate tradition and bought a 12-percent interest in Intel (the maker of the PC's 8088 microprocessor brain). According to The New York Times, Opel's leadership has been marked by "a new flexibility."

Of course, IBM has not been the only company whose economic star has risen of late. Bulls began charging onto Wall Street a year ago, and the entire stock market soared to record highs.

"Two or three years ago nearly all high-technology stocks were priced at one-half of what they are today," noted Kenneth G. Bosomworth, president of International Resource Development, a market research and consulting firm. "IBM's increase would have happened even without the PC."

A New Image

A company's fortunes depend on more than just the twists of the ticker tape; image is important, too. It can determine how consumers view an organization, how and by whom its stock is traded, and how its employees feel about working there. Even if the PC hasn't had a major financial effect on the corporate colossus, it has revealed a new and different IBM to the world.

"The PC has done a lot for IBM in the public mind," said Dyson. "It's helped change the corporate image and made IBM seem more human, more friendly, and more approachable."

"The PC has helped make IBM what I call a 'stomach stock,' a stock that's in the experience of the common man. It's a company whose product he has seen and touched. Other stocks do not touch his life personally," Dyson continued. Her stomach stocks are those of companies active in selling to the consumer market. The PC was IBM's first product to attract notable individual-consumer interest. "The changed image probably helped some, even though institutions rather than small investors are the big holders of IBM's stock." (Pension funds and other institutional investors hold about 55 percent of IBM's stock.)

WHAT A SWITCH!

Intra's **Printer Switch** for all Personal and Business Computers lets your **WordProcessor's** copy be easily directed to either a **Dot Matrix** or **Letter Quality Daisywheel Printer**. Compatible with all Centronics Parallel type interfaces, the **Printer Switch** is styled to match computer hardware in the Home or Office.

**\$165
Including
Cables**



**intra
computer**

101 W. 31st Street
New York, N.Y. 10001
(212) 947-5533

CIRCLE 476 ON READER SERVICE CARD

Some analysts believe that IBM's new image has influenced institutional investors as well. In pre-PC 1981, *Financial World* noted that IBM stock was perceived as "tired merchandise" with "lackluster price performance" that made it "a drag on portfolios." The "slack lion" reigning over the corporate jungle had become a "lumbering alaphant." Analysts figured that IBM had gotten too big and had been overcoma by inertia. Newer, leaner companies were outpacing the sleeping giant. Digital Equipment Corporation (DEC), particularly, had grown to be number two in computers, according to some analysts, because IBM was too slow in entering the minicomputer field.

When IBM led the market upward 2 years later, *The New York Times* asked, on April 15, 1983, "What changed the outlook for the company after years of uninspired performance?" The answer was, in part, its success in entering the personal computer market.

"The PC was a good move PR-wise," noted Bosomworth. "It positions IBM as a company that is not going to be outpaced, as it was when DEC entered the minicomputer market. Clearly IBM let DEC go too far. By introducing the PC, IBM did not let that happen with micros. If they had not entered the market, it would have suggested that they had been caught napping again."

"Wall Street is enamored of IBM because the company is able to do progressive things," added Fram. "Usually investors are leery of progressive companies, but IBM is progressive and trustworthy."

"In my estimation, the PC has made it clear that IBM is more vigorous and open-minded than it once was," said Dyson. "It's shaken up IBM a bit. The company has its eyes opened to a new market and a new style of operating. Suddenly IBM looks a lot more adventurous. It's making returns by taking risks, beginning to live more dangerously, and I like that."

Indeed, not only has the PC presented the world with a new image of IBM, but it has given IBM a new view of the world. The popular micro is far more than just another desktop device: it's a reflection of IBM's philosophy. And it reveals some recent changes in that philosophy—changes that may have been caused by the PC itself.

"IBM wants a PC on the desk of every executive/white-collar worker," said

***T**HE PC has indeed become a financial fountain of youth that has revitalized middle-aged IBM.*

Fram. "It wants to have 20,000,000 work stations out there by 1990. That's enough that it can have market control."

"IBM figures that something is going to end up on every executive's desk, and it might as well be an IBM," affirmed Bosomworth. "An essential element of IBM's strategy since the days of the first tabulating machines has been to get into the Fortune 500 companies and get them as dependent on IBM as possible."

"IBM's strategy has changed. It recog-

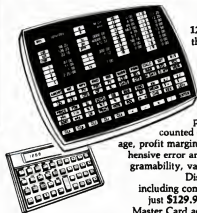
nizes that its growth will be in different areas than it has been in the past. Now IBM is looking to integrate the whole office, and it has centered a key part of its growth strategy on the PC," said Fram. "It has begun to integrate other products around the PC. The company already has PC emulation in just about all of its work stations."

A Hint of Things to Come

At just more than 2 years old, the PC is still too young for its full potential and consequences to be seen and measured, even by the wizards of Wall Street. Already, it has grown from a speck on an enormous corporate spreadsheet into the brightest twinkle in the eye of an old giant—a twinkle that belies the very clever thoughts going on in the giant's head.

Only by looking back years from now will all his secrets be known. Perhaps far from being just another product, the PC will someday be looked upon as the cornerstone of a new philosophy and a new IBM. /PC

Finance 12Q™ calculations: What you get is what you see.



MicroQ's breakthrough, Finance 12Q, performs all the functions of the most popular executive/financial calculators with computer power, calculator simplicity and one important difference: a screen display of *all* values at-a-glance.

Finance 12Q provides compound interest, amortization, discounted cash flow, depreciation, percentage, profit margin, on-line help screen for comprehensive error and command reporting, user programmability, value annotations and much more.

Diskette programs for the IBM PC, including comprehensive, easy-to-use manual, just \$129.95. Call (703) 385-6450. Visa and Master Card accepted. Dealer inquiries invited.

Specific calculation capabilities include:
Net Present Value (NPV) / Modified Internal Rate of Return (MIRR) / Present Value / Future Value / Payment Amount / Number of Payments / Interest Rate / Odd-Period / Gross Profit Margin (GPM) / Selling Price / Cost / Amortization / Depreciation / Straight-Line / Sum-of-the-Years-Digits / Declining-Balance / Bond Price / Bond Yield / Mean / Standard Deviation / Weighted Mean / Linear Estimation / and more...

MicroQ Incorporated
3843 Plaza Drive / Fairfax, Virginia 22030

CIRCLE 506 ON READER SERVICE CARD



Perfect Compatibility



Competitive prices, prompt service, and complete support.

SPECIALS OF THE MONTH

Control Data

Full Size 320K DS/DD \$ 235*

"lowest price in the nation"

"The drive that IBM trusted with its logo."

NEW half height

Control Data \$ 195

Quiet, reliable, compatible
No special mounting brackets required.

• All 5¼" drives come with complete installation instructions and all necessary brackets and screws. Drives come configured as drive A or B for your PC.

AST Research

SixPack Plus (for IBM-PC or XT) \$ 269

Upgradable to 384K, with clock calendar, serial and parallel ports (game port optional)

5251 Terminal Emulator \$ 795

3270 Terminal Emulator \$ 795

(Emulators include all necessary hardware and software)

64K RAM Chips fully tested \$ 55

Multimate \$ 295

An advanced word processor with all the features and power of a dedicated, stand-alone system

Microsoft

Multiplan \$ 160

Flight Simulator \$ 30

HARDWARE

Disk Drives

Davong

5MB Internal Hard Disk \$ 1465

10MB Internal Hard Disk \$ 1695

(includes power-supply, controller card and software)

Control Data

Full Size 320K DS/DD \$ 235

Half-Height 320K DS/DD \$ 195

TEAC, Hitachi, Matsushita

Half-Size 320K DS/DD w/brackets Call

Simline 640K DS/DD w/brackets \$ 310

Tall Tree Systems JFormat software \$ 25

Scotch/3M DSDiskettes (box of 10) \$ 39

Expansion Boards

AST Research

[All AST boards come with SuperDrive, Superspool, and one year warranty]

SixPack Plus (See Specials of the Month) \$ 269

ComboPlus 64K upgradable to 256K, with clock calendar, serial and parallel ports \$ 280

MegaPlus II 64K (upgradable to 256K, or 512K with

MegaPak) with clock calendar and serial port \$ 280

MegaPak 256K upgrade for MegaPlus Call

I/O Plus II clock calendar and serial port \$ 115

Memory Upgrade Set (9 chips) 64K \$ 55

Connectall Bracket for extra cables \$ 20

Option Kits for AST Expansion Boards

parallel, serial, game port \$ 35

Hercules Computer

Graphics card (parallel port) \$ 395

IRMA Call

Maynard Electronics

Modular Disk Controller Card \$ 195

Standard Disk Controller \$ 155

with serial port \$ 219

with parallel port \$ 209

Memory Module \$ 95

Game Adapter Module \$ 50

Parallel Module \$ 65

Serial Module \$ 90

Clock Module \$ 70

Plantronics/Frederick

Colorplus \$ 379

Surge Suppressors (industrial quality) Call

SPECIAL COMMUNICATIONS PACKAGE

Includes Hayes 1200/300 Baud Smart Modem, serial cable and Crosstalk Communications/Terminal Emulation software. All you need for easy and efficient computer communication with your PC \$ 640

- Next Day Shipping
- No Credit Card Surcharge
- Company P.O. Accepted

Perfect Compatibility



Toll-Free Consultation — Give us the problem. We have the solution.

MODEMS

Hayes

Smartmodem 1200	\$ 509
Smartmodem 300	\$ 209
Smartcomm communications software	\$ 99
Smartmodem-to-IBM six foot cable	\$ 25

Hayes Smartmodem 1200B

Internal modem includes Smartcomm II software	\$ 469
---	--------

MicroStuf

Crosstalk communications software	\$ 119
-----------------------------------	--------

PRINTERS

Citoh

Starwriter F10-40PU 40cps	\$ 1395
Printmaster F10-55PU 55cps	\$ 1695

Epson

MX-80 F/T, Graphtrax II	\$ Call
MX-100 F/T, Graphtrax II	\$ Call
FX-80 F/T, Graphtrax II	\$ Call
RX-80	\$ Call

NEC

Spinwriter 3550	\$ 1895
-----------------	---------

Okidata

Microline 83A F/T 120 cps, 132 cols	\$ 625
Microline 92 160 cps, 80 cols, Okigraph, correspondence quality	\$ 495
Microline 93 F/T 160 cps, 132 cols, Okigraph, correspondence quality	\$ 795
Microline 84 F/T 200 cps, 132 cols, Okigraph, correspondence quality	\$ 990
All printer cables	\$ 30

We carry a full line of printer accessories

MONITORS

Amdek

Video 300 Green (Graphics card)	\$ 155
Video 300 Amber (Graphics card)	\$ 165
Video 310 Amber (monochrome card) (we supply cable for all Amdek monitors)	\$ Call

Princeton Graphics

PGS Hi Res RGB Monitor with cable	\$ Call
-----------------------------------	---------

USI

P12 Green (Graphics Card)	\$ 155
P13 Amber (Graphics Card)	\$ 165
MultiDisplay Card	\$ Call

(We supply cable for all USI monitors)

SOFTWARE

Ashton Tate

dBase II	\$ 419
----------	--------

Fox & Geller

Quickcode	\$ 179
-----------	--------

Financier

Personal Series	\$ 129
Tax Series	\$ 119

IUS

EasyWriter II	\$ 205
---------------	--------

Lifetree

Volkswriter	\$ 120
Volkswriter International	\$ Call

Lotus Development

1-2-3 (with tutorial on disk)	\$ Call
-------------------------------	---------

Microsoft

Multiplan	\$ 160
-----------	--------

Micropro

WordStar	\$ 279
WordStar/MailMerge	\$ 349
WordStar/MailMerge/Spellstar (Newest versions, 3.3)	\$ 429

Sorcim

SuperCalc2	\$ 160
------------	--------

Lattice

C Compiler	\$ 325
------------	--------

Cdex

Training for Lotus	\$ 59
All other training packages available	\$ 59

Wang Publication

Random House Proofreader	\$ 45
--------------------------	-------

Central Point

Copy II PC	\$ 35
------------	-------

Rossoft

ProKey	\$ 59
--------	-------

GAMES

Infocom

High Quality Text Games	
Zork I, II or III	\$ 26

Starcross

Deadline	\$ 34
----------	-------

Suspended

Witness (new)	\$ 34
---------------	-------

Microsoft

Flight Simulator	\$ 30
------------------	-------



APPLIED COMPUTER PRODUCTS INC.

1916 Welsh Road #6, Philadelphia, PA 19115

215-934-6990

1-800-223-3860

Our Policy

- We accept VISA, Mastercard, Money Order, Certified Checks, Cashiers Checks, Personal Checks, Wired Funds. • We do not charge your card until we ship.
- No surcharge added on VISA and Mastercard.
- Allow one week for personal and company checks to clear. • COD maximum \$500. Cash or Certified check on delivery. • Please use local phone number for order status inquiries.

SHIPPING (U.S.): For monitors, printers and hard disk drives add 2% to all orders. Blue label and hard disk Air available. For all other items add \$4. Most orders shipped next day.

MICRO MATCH

Hardware Accessories Software

Low Prices!

**Send
for our
free Catalog**



Expansion Boards

AST RESEARCH

ALL AST RESEARCH boards include SuperDrive and SuperSpool software.

MEGAPLUS II — Expands to 512K with 256 MEGAPAK or to 384K with 128K MEGAPAK. Includes CLOCK/CAL & 1 SERIAL PORT.

W/64K 265.00

W/256K 430.00

256K MEGAPAK 275.00

128K MEGAPAK 199.00

OPTIONAL 2nd SERIAL PORT 40.00

OPTIONAL PARALLEL PORT 40.00

OPTIONAL GAME PORT 40.00

COMBOPLUS expands to 256K, includes CLOCK, PARALLEL & SERIAL ports.

W/64K 265.00

W/256K 430.00

I/O PLUS II — I/O only (no memory). Includes CLOCK & 1 SERIAL port.

I/O PLUS II 120.00

OPTIONAL 2nd SERIAL PORT 40.00

OPTIONAL PARALLEL PORT 40.00

OPTIONAL GAME PORT 40.00

SIX PACK PLUS — expands to 384K, includes CLOCK, PARALLEL & 1 SERIAL port.

W/64K 265.00

W/384K 549.00

OPTIONAL GAME PORT 40.00

QUADRAM

ALL QUADRAM boards include QUAOMASTER software.

QUADBOARD I — expands to 256K & includes 1 SERIAL port, 1 PARALLEL port & CLOCK/CALENDAR.

QUADBOARD I W/64K 275.00

QUADBOARD I W/256K 430.00

QUADBOARD II — expands to 256K & includes 2 SERIAL ports & CLOCK/CAL.

QUADBOARD II W/64K 275.00

QUADBOARD II W/256K 430.00

Disk Drives

All floppy disk drives are double sided, double density and include complete installation instructions and all hardware. Floppy drives from Micro Match include our exclusive 90 day replacement warranty. Call for details.

CIC 9409 259.00

TANDON TM 100-2 249.00

SHUGART (half-height, 1 year) 239.00

FLOPPY DISKETTES

GYSAN 2 sided, double density. Box of 10 43.00

QUADBOARD 512+ expands to 512K & includes 1 SERIAL port.

QUADBOARD 512+ W/64K 259.00

QUADBOARD 512+ W/512K 675.00

SEATTLE COMPUTER

ALL SEATTLE COMPUTER RAM + boards include FLASH DISK software.

RAM + memory & 1 serial port

RAM + W/64K 185.00

RAM + W/256K 325.00

RAM + 3 memory, 1 serial port, 1 parallel port & clock calendar

RAM + 3 W/64K 255.00

RAM + 3 W/256K 395.00

TALL TREE SYSTEMS

ALL TALL TREE SYSTEMS boards include JIFORMAT & JETDRIVE.

JRAM — memory only, expands to 512K.

JRAM OK 249.00

JRAM 512K 665.00

Displays

AMDER SCREEN DISPLAYS

AMDER 300A for color card 155.00

AMDER 310A for mono card 170.00

COLOR DISPLAYS

AMDER COLOR II hi res RGB 435.00

AMDER COLOR IV hi res RGB 1125.00

ELECTRONOME 1302-2 hi res RGB 575.00

DISPLAY ADAPTER BOARDS

HERCULES high resolution monochrome graphics adapter card 375.00

Printers

EPSON PRINTERS

FX 80 parallel 542.00

MX 100 parallel 610.00

FX 100 parallel 699.00

OKIDATA PRINTERS

ML 80 parallel 330.00

ML 92 parallel 515.00

ML 93 parallel 910.00

2350 serial 2170.00

2410 serial 2460.00

NEC PRINTERS

3510 Spinwriter 1470.00

3525 Spinwriter 2120.00

3550 Spinwriter 1880.00

Ram Chips

RAM CHIPS — All RAM chips from Micro Match are the highest quality components available anywhere. Every RAM chip comes with the Micro Match 90 day exchange warranty. Call for details.

64K, set of 9 (200 nsec) 59.00

Modems

HAYES MODEMS

SMARTMODEM 300 209.00

SMARTMODEM 1200 499.00

SMARTMODEM 1200B 450.00

300 PACKAGE — Modem, Cable & SmartCom II software 299.00

1200 PACKAGE — Modem, Cable & SmartCom II software 579.00

Software

ASHTON-TATE

dBASE II 8425.00

FINANCIAL PLANNER 455.00

BOTTOM LINE STRATEGIST 265.00

FRIDAY 179.00

COMBOR

20-3 DATA BASE MGR 415.00

FIX & SELLER 210.00

QUICK CODE 210.00

DGRAPH

LIFETREE 135.00

VOLKSWRITER 1.2 169.00

VOLKSWRITER INTERNATIONAL 169.00

LOTUS

123 (VERSION 1A) 335.00

NATES 85.00

SMARTCOM II

PEACHTREE 239.00

PEACHPACK 4 GL/AR/AP 239.00

PEACHTEXT 5000 239.00

8086CM

SUPER CALC II 182.00

SUPER WRITER 182.00

SUPER SPELLGUARD 125.00

TALL TREE SYSTEMS

JIFORMAT 39.95

To Order by phone call (213) 352-3253. Send Check or Money Order. Master Card/Visa accepted (Include expiration date & signature). Add \$3.50 for shipping, handling & insurance (2 day Airmail \$8.00). All orders shipped UPS unless otherwise specified (Continental US only). Other shipping methods or destinations, call for best way & price. California residents add 6 1/4% sales tax. All items subject to availability. Prices subject to change without notice.

MICRO MATCH Quality Products
Personal Computer

10049 Commerce Ave • Tujunga, CA 91042 • (213) 352-3253

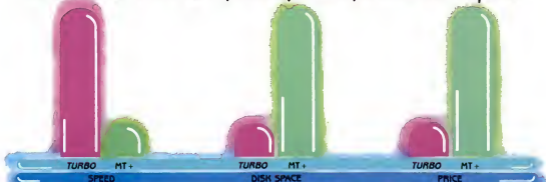
CIRCLE 320 ON READER SERVICE CARD

PASCAL

\$49.95

Introductory
offer

Standard Pascal for Your IBM PC, MS-DOS, CP/M 86, and CP/M 80 Computers



Hang on to your seats! It's *Turbo Pascal*.

	<i>Turbo Pascal</i>	JRT	MT+
8 & 16 bit	YES	NO	YES
Editor	YES	NO	NO
Generate Object Code	YES	NO	YES
Locates Run-Time Errors Directly in Source Code	YES	NO	NO
Compilation Speed *	1 s.	46 s.	69 s. includes listing
Execution Speed *	6 s.	69 s.	8 s.
Disk Space	27K including editor	85K + editor	168K + editor
Price	\$49.95	\$39.95	\$595.00

Benchmark data based on EgghQueens in "Algorithms + Data Structures - Programs" by R. Wirth (Prentice-Hall, publisher)

There has never been a Pascal compiler this good with so many powerful features. We know what you've been waiting for: a true Pascal compiler that works fast, offers a full screen editor, and has a great price.

Turbo Pascal has it all. First, we've included a built-in, interactive full screen, Wordstar compatible editor; it not only lets you correct errors, but during program compilation the cursor even jumps directly to the error and waits for your correction. No kidding. Second, it takes only 27K of disk space, including the editor, and on your microcomputer you need all the space you can get. *Turbo Pascal* is

10 to 70 times faster during compilation, as well as execution than Digital Research's MT+ or JRT Pascal.

Hard to believe your good fortune on the price? Don't worry. We're Borland, and we produce only quality, state-of-the-art software. Companies such as Micro Pro, Morrow Computers, Access and others distribute our software products, so you can't go wrong.

Place your order today. And we'll ship your *Turbo Pascal* out fast. For VISA and MasterCard orders call toll free:

1-800-227-2400 X 968
IN CA: 1-800-772-2666 X 968

Turbo Pascal \$49.95 + \$2.00 shipping per copy.

Check ☐ Money Order ☐
VISA ☐ MasterCard ☐

Card # _____
Exp date: _____ Shipped UPS



My system is: 8 bit ☐ 16 bit ☐
Operating system: CP/M 80 ☐
CP/M 86 ☐ MS DOS ☐ PC DOS ☐
Computer: _____ Disk Format: _____

Please be sure model number and format are correct.

NAME: _____
ADDRESS: _____
CITY/STATE/ZIP: _____
TELEPHONE: _____

BORLAND INTERNATIONAL

Borland International
4807 Scotts Valley Drive
Scotts Valley, California 95066

California residents add 6 1/2% sales tax. Outside North America add \$15.00 for airmail, or \$5.00 for surface mail. Checks must be on a U.S. bank, and in U.S. dollars. Sorry, no C.O.D.

Turbo Pascal is a trademark of Borland International. MT+ is a trademark of MT MicroSystems. JRT Pascal is a product of JRT. Wordstar is a trademark of Micropro.





IBM EYE/BILL MACHRONE

Come along on a photo tour of the IBM assembly plant in Boca Raton for a look at what goes "into" the making of a computer.

IBM Assembly: The Inside Story

As you drive through the environs of Boca Raton and Delray Beach, you can't help but be struck by the verdant bleakness found only in southern Florida. The susurrations of cars and trucks are jarringly at odds with a place where once the loudest sound was the occasional thud of a coconut falling to the ground. Buildings the color of earth and sand rise monolithically from the landscape, their right angles and hard edges claiming dominance over nature. As you turn into the drive, the letters IBM, subtly displayed on a sign, suddenly alter your perception of the entire scene, replacing the intrusive nature of the buildings with a new vision

of a corporate network that spans the globe, dwarfing the local countryside.

The building is IBM's final assembly/manufacturing point for PCs and XTs. You enter, perhaps expecting magic. What you see is a clean, modern assembly plant that just as easily could be used to build fire extinguishers and blenders. Not that the techniques are not state of the art. In fact, they may be more so than the product, the PC.

Some interesting facts gleaned from the tour include the following:

- Each PC is assembled by one person. It is not built on a TV-type assembly line.
- Each PC is tracked from chassis to final



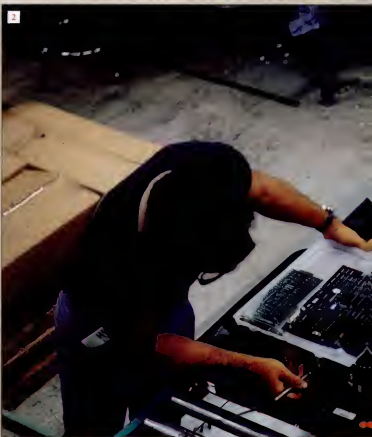
shipment using UPC-like bar-code readers.

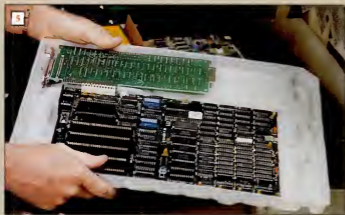
■ PCs help to build PCs. Modified PCs govern much of the quality-control testing process.

■ Each PC or XT is "kitted," that is, all the necessary parts are placed in a box, and the chassis is placed on a pallet for its trip to the assembly line. The pallet is connected electrically to the PC, providing AC and keyboard connections for use in automated testing. The test equipment "keys in" instructions to the PC; a monitor connection "sees" the result.

The factory is quietly busy. Without raising much of a fuss, it cranks out (we estimate) between 3,000 and 4,000 machines per day in three shifts. After packaging, the machines ride from one building to another via a conveyor into an automated warehousing system. A huge grid of girders, rollers, and slides stores the PCs, much like pieces in a gigantic 3-D chess game.

Come with us as we tour the plant; we think you'll like the show. /PC





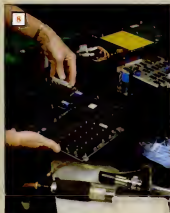
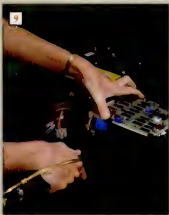
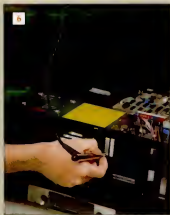
1 Life begins for the PC as a serial number sticker is attached and entered via bar-code reader into the manufacturing system.

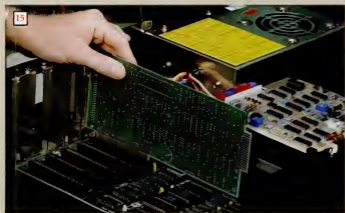
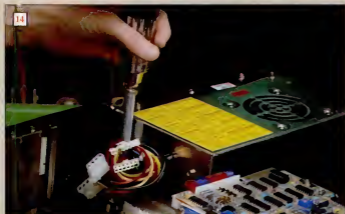
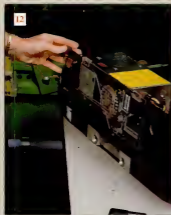
2 PCs are "kitted" for assembly with all the necessary parts placed on the pallet or in a tray.

3 Kitted PCs line up on the rollers, waiting to coast down to available assemblers.

4 Roll out! PC kits head down the line for assembly.

5 The assembler removes the kit tray from the pallet in preparation for putting the PC together.





6 The bor-code wand informs the manufacturing system that a PC has arrived at a particular work station.

7 Even with bor-code readers tracking the machine, the assembler still must document phases of the construction process.

8 The assembler prepares to insert the system board into the chassis. The system board already has been tested by IBM personnel stationed at the vendor.

9 An air-powered screwdriver feeds the screws from a bin, aligns them, and drives them home automatically, here securing a disk drive.

10 The speaker and bracket go into place, again using standard-size screws fed from the automatic screwdriver.

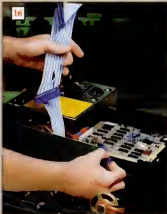
11 The assembler inserts a test/diagnostic disk for quality control and burn-in testing.

12 A special template ensures that the labels on the rear of the machine are aligned properly and consistently.

13 A few quick shots with the air screwdriver and the power supply is firmly in place.

14 Final tightening of the screws holding the system board. The screwdriver has a built-in torque limit, preventing overtightening.

15 The disk controller cord, positioned for insertion.



16 The assembler then positions the ribbon cables connecting the disk drive to the controller card.

17 On a single-drive system, a blank cover is fitted.

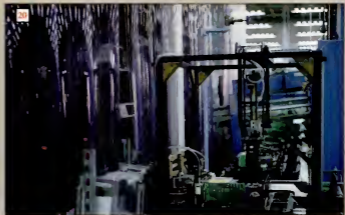
18 Initial test and burn-in area. Note PC used to control a phase of the testing.

19 A robot arm turns the PC on for the first time and go/no go tests determine whether it will go to burn-in or back for rework. Microphone (disconnected here) detects unusual noises.

20 PCs en route to the 3-hour burn-in test. Plastic wall controls dust, keeps burn-in area slightly warmer than the rest of the plant.

21 Large robot arm takes PC from assembly line and places it in a tier on the burn-in rack.





22 After burn-in, cover goes on, packing begins. Here, vacuum arm lifts completed PC from pallet, holds it for "diapering" with protective plastic.

23 Worker positions box above PC, pneumatic arm lifts it into box, closes flaps. Printer provides label identifying machine by serial number after cross-check by bar-code wand.

24 What your local ComputerLand wouldn't give for a few of these! Palletized boxes of PCs await shipment.

25 Out the door! Finished PCs are shipped to dealers all over the world.



Introducing the first computer games that pay you to own them.

Virtually all computer games provide entertainment value.

These new games from Blue Chip also give you practical value—of the most rewarding kind.

They put you in high-powered, real-world environments. Where you create strategies. React to constantly changing conditions. And learn solid skills in competing for extraordinary payoffs:

Millionaire™ You build a portfolio of actual NYSE companies, whose fortunes are tied to a universe of plausible events and variables to consider. Over 300,000 possible combinations of events mean you can play a lifetime without a repeat.

Baron™ Buy and sell all manner of real estate nationwide as you strive to amass a personal empire. Factors include realistic property values, overall economy and local idiosyncrosies.

Tycoon™ If gold, silver, foreign currencies or other commodities quicken your pulse, play Tycoon and learn the ins and outs of this most volatile of financial arenas.

Squire™ The object here is to retire, financially set, in short order. Game is so realistic you can plug in your personal parameters, choose a lifestyle then follow the guidelines to attain it.

Entertain your brain. Sharpen your financial acumen. For both fun and profit. With these practical new games from Blue Chip.



BLUE CHIP SOFTWARE • (213) 881-8288

Available wherever finer software is sold. On disk for DEC Rainbow 100, DECmate II, IBM PC, TI Professional, Apple, Commodore 64, Osborne, Aion, Kaypro and others.

CIRCLE 165 ON READER SERVICE CARD

McCormick,
Greenburg & Benz
Financial
Management

MG
Frank -
who said playing
computer games is
a waste of time?
I suggest you check out
the ones from
Blue Chip.
J.P.

IF YOU'RE CONSIDERING CONSIDER

As a knowledgeable personal computer user, you know that there's a world of difference between first generation software products and second. (Think of VisiCalc™ and Lotus 1-2-3™ for example.)

It's the difference between setting standards. And then raising them.

INTRODUCING R-BASE,™ FROM MICRORIM.™

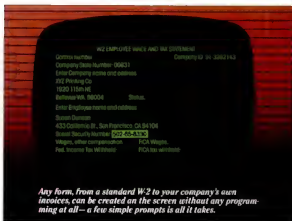
Rbase is the new generation of relational database software. With a combination of capacity, speed and transportability that today's more powerful PC applications need. (Check out the comparisons.)

Not only that, Rbase is much simpler to use and learn. So your applications are up in days, instead of weeks. And anyone—computer literate or not—can enter and view data, and generate reports. Just what you would expect from a second generation product.

MANAGING A DATABASE. CONVENIENTLY.

With Rbase, it's simple. A series of prompts guides you every step of the way. Which means you don't have to be a programmer to create data entry or report forms just like the ones you're used to using.

As you become more proficient, you'll create shortcuts by customizing menus of stored commands. And print reports



as simple or complex as you like at the touch of a key. With Rbase, prompted, ad-hoc queries and customized report formatting become the reality that first generation products could only promise!

Rbase is also very forgiving. It's very hard to make a mistake. That's because commands are simple English expressions—like SELECT, PROJECT, WITH, WHERE, FROM, etc. Dates and dollar amounts are written normally: 11/16/83;

	MAXIMUM RECORDS/ DATABASE	FILES AVAILABLE CONCURREN- TLY	MAXIMUM NUMBER FIELDS DATABASE	TIME TO SORT 1000 RECORDS* (MIN: SEC)	UPDATE MULTIPLE FILES CON- CURRENTLY	PRICE (LIST)
R-BASE 4000	100 billion	40	400	0:59	Yes	\$195
dBASE II	65,535	2	32	5:47	No	\$695
CONDOR	32,768	2	127	2:03	No	\$650

*Sort 1000 records on 1 key value. (IBM PC with 256K and DS/DD diskettes)

dBASE II is a trademark of Ashton-Tate. VisiCalc is a trademark of VisiCorp. 1-2-3 is a trademark of Lotus. MultiPlan and MS-DOS are trademarks of Microsoft. CTUS is a trademark of Convergent Technologies. Lotus is a trademark of Bell Labs.

PURCHASING dBASE II, THIS FIRST.

SELECT (relation Ref), (Attribute Ref), (Op), (Op2)

SELECT is used for selective queries from a relation.

What is the name of the relation? (EMPLOYEE)

Enter the word ALL to display all attributes or a

list of attributes. If you want selective attributes,

Enter ALL or a list EMP_NAME EMP_SS SALARY DEPT

Enter the attributes to be used for sorting

(this is optional)

Attribute list: DEPT

What conditions must be met? (this is the

optional WHERE clause)

WHERE

SELECT emp_name emp_ss salary dept FROM employee SORTED BY dept

EMP_NAME	EMP_SS	SALARY	DEPT
GEORGE SMITH	501-67-9021	\$2900	ACCOUNTING
AL RIDER	543-67-8962	\$3100	ACCOUNTING
RODOLPH JONES	507-43-9837	\$2400	ADVERTISING
BILL MURPHY	508-34-2175	\$4000	MARKETING
SALLY RIDER	507-34-8462	\$2400	MARKETING
SUSAN DUNCAN	502-65-6330	\$2700	PERSONNEL

New users can also choose to have command prompting. All you do is answer a sequence of plain-English questions by filling in reversed-out fields. R-base does the rest.

And here's your list. Notice that the command formed by "filling in the blanks" on the previous screen is written out to teach new users about R-base.

\$500.00. And, because data entry verification rules are defined up front, you just can't put any "garbage in"—even if you try!

What's more, Rbase allows you to sort and select data on up to ten different criteria, perform totals, and then display the results—all with a single, powerful command (see screens).

QUESTIONS? ASK FOR HELP.

The Rbase HELP feature provides detailed information that describes every command and process required for complete mastery of the database. (As does our plain-English documentation.) For example, if you're not sure what SELECT does, simply key in HELP SELECT and Rbase will tell you what the command does, how it works, even the proper syntax. This way you don't have to keep referring back to the user manual—it's all right there in front of you.

R-base + MULTIPLAN™ = POWER²

Unlike first generation microdatabases offering the "amazing" capacity of one file and some 60,000 records, Rbase literally blows the lid off database size. You may never create an application using forty files with 100 billion records. But with Rbase, you can.

Now imagine being able to tap all that power in conjunction with one of the most popular spreadsheet programs on the market today: MultiPlan. Rbase is fully compatible with MultiPlan, so you can zip back and forth between programs without cumbersome file manipulation.

THE R-base PRODUCT FAMILY.

Rbase™ 4000 is a single-user relational database (MS-DOS™

version is list \$495). Rbase™ 6000 is a multi-user version, available early 1984. In addition to MS-DOS, both packages will also be available in CTOS™ with UNIX™ to follow.

The optional extended ReportWriter™ provides enhanced reporting and calculating capabilities (MS-DOS version is list \$150). Program Interface™ is a set of subroutines which allows direct database access from PASCAL or FORTRAN programs (MS-DOS Version is list \$395).

And what happens if you've already got dBASE II? Not to worry. It's easy to transfer your files to Rbase.

FULL DEMO PACKET, \$9.95.



Does all this sound too good to be true? If you think it does, let us prove to you that Rbase is for real. With a comprehensive tutorial and demo diskette that will give you convincing hands-on experience. Just call our order desk at (800) 227-6703 (in California, 800-632-7979) and have your VISA or MasterCard number handy.

Better yet, hurry over to your nearest computer or software retailer for an eye-opening demonstration.

MICRORIM™

Relational Information Management

Microrim, Inc.

1750 112th N.E.

Bellevue, WA 98004

CHAMELEON
by SEEQUA

Compatible With Your Environment

- IBM Compatible
- CP/M™ Compatible
- \$1995 Complete*



For business, professional and personal computing, Chameleon is the tool that works as hard as you do. It's there where you need it, when you need it. Complete with word processing and spreadsheet software at no extra cost. Put Chameleon in your environment. It blends right in.

Find out more at your authorized Chameleon dealer. For the one nearest you call 1-800-638-6066.

*Manufacturers list price. Includes 320K disk storage, 128K RAM, dual 8 and 16 bit processor, Perfect Writer word processing software, Perfect Calc spreadsheet software...and more.



SEEQUA
COMPUTER
CORPORATION

8305 Telegraph Road
Odenton, MD 21113
(301) 672-3600 or
(800) 638-6066

The following are registered trademarks:
IBM — International Business Machines
Perfect Writer — Perfect Software
Perfect Calc — Perfect Software
CP/M — Digital Research Inc.

CIRCLE 370 ON READER SERVICE CARD



RELAX!

I FOUND THE INFORMATION

The selection was easy. Because the entire EDP industry is now organized, defined, cross-referenced, re-surveyed, updated and delivered to me four times a year for \$60.

Cuts my search time . . . gives me all my options . . . and saves my company money.

DATA SOURCES has sorted all significant EDP vendors and products for you—and compiled them in two easy-to-use volumes. Supported by an extensive data base, each issue is re-surveyed, updated and mailed every 90 days to keep you current with the latest product information.

DATA SOURCES' format provides you consistent product listings and comparison charts—including capability, compatibility,

and cost . . . to allow fair and accurate evaluations. It is fully indexed and cross-referenced each quarter—by product type, supplier and system fit.

- NEW! • **Market Tracking:** Exclusive product trend feedback from the publication data base
- NEW! • **Before You Buy:** Product selection criteria and checklists
- NEW! • **Product Comparison Charts:** At-a-glance review, compares each vendor's product feature by feature
 - Over 26,000 products: from micros to mainframes
 - 14,000 software packages: systems, utilities and applications



..... IN DATA SOURCES

- Over 12,000 hardware and communications products: from systems to peripherals . . . from modems to complete networks
- 7,200 company profiles: current names, addresses and phone numbers



**WHEN THE ISSUE
IS INFORMATION...**

DATA SOURCES

P.O. Box 5845 • Cherry Hill, N.J. 08034

DATA SOURCES

P.O. Box 5845 • Cherry Hill, N.J. 08034

TC91

**Yes, I need accurate information delivered
4 times a year.**

☐ Please send me the current edition of DATA SOURCES and enter my one year subscription at \$60 (A 50% savings off the regular rate of \$120.)

☐ Check enclosed. ☐ Bill me.

NAME _____

TITLE _____ PHONE (____) _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

NATURE OF CO. BUSINESS _____

**OR, ORDER DIRECT!!! 1-800-227-1617 ext. 251
(in California, 1-800-772-3545 ext. 251)**

Residents of CA, CO, CT, DC, FL, IL, MA, MI, MO, NJ, NY, VT,
PLEASE ADD APPLICABLE STATE TAXES.

CIRCLE 137 ON READER SERVICE CARD

Buy Smartmodem 300 *right now*, and get this \$140 value FREE!

Subscription to **THE SOURCE**, including User's Manual. Value \$100*

One hour connect time. Value \$20.75**

A comprehensive, hard-bound handbook on communications. Value \$19.95



Your computer's telephone Hayes



Between Nov. 1-Jan. 15, you and your personal computer can make the big break. From isolated desktop computing. To the exciting world of telecomputing. With Hayes Smartmodem 300. The most popular 300 bps modem you can buy, for any computer with an RS-232C port. Let Smartmodem 300 connect you, via telephone lines, to computers, terminals and information services all across America. Including **THE SOURCE**™ AMERICA'S INFORMATION UTILITY.™

This offer takes you right to **THE SOURCE**! And you won't have to pay to join! The same day you purchase your Smartmodem, call **THE SOURCE** on their toll-free number. And you're already well on your way to getting on-line!

It frees up your time. This offer also entitles you to \$20.75 worth of connect time—at no charge. Use it as you please! Get the latest news and sports. Look up your flight schedule. View your stock portfolio. You name it. The time is yours! Sixty minutes

worth, or more, depending on the day and hour.

Giving you lots of connections. **THE SOURCE** has assembled the most comprehensive programs available on any system. For fun and practical applications. From games to commodity news. Electronic mail to teleconferencing. Discount shopping to abstracts of articles from business magazines.

And everything you need to know is right

there in your comprehensive, illustrated User's Manual. Included with your free membership to **THE SOURCE** during this special, limited time offer from Hayes.

Plus the last word on communications. Now here's a book that delivers what it promises! In Alfred Glossbrenner's best seller, **THE COMPLETE HANDBOOK OF PERSONAL COMPUTER COMMUNICATIONS**, you'll find a thorough, informative study of microcomputer communications. Worth every cent of the \$19.95 this hard-bound book sells for. And yours absolutely free!

If you act now! See your dealer soon. Buy Smartmodem 300, and get the best 300 bps modem around.

Plus a \$140 value FREE. **Hayes Microcomputer Products, Inc.** 5923 Peachtree Industrial Blvd., Norcross, Georgia 30092. 404/449-8791.



Here's all you have to do:

1. When you purchase your Smartmodem 300, save your sales receipt and Hayes registration card (packed inside the box).
2. Pick up the phone and call **THE SOURCE**, on their toll-free number:
1-800-336-3366.

Tell **THE SOURCE** representative that you are participating in the special Hayes promotion, give the serial number of your Smartmodem (on the modem), and your credit card number (VISA, MasterCard, or American Express).† You will get your password to **THE SOURCE**, right on the spot!


3. Within a week you will receive an agreement from **THE SOURCE**, along with your New Member Kit. Sign the agreement, and return it within 10 days to **THE SOURCE**, along with your sales receipt for Smartmodem 300 and Hayes registration card. Remember, send no money. Your membership is free!

4. That's all it takes! Look for your User's Manual and free communications book within two weeks of receipt of the agreement, sales receipt and registration card.

†**THE SOURCE** requires a major credit card for billing of hourly connect time to individual members. Corporate members may apply for direct billing.

*Suggested retail price. **60 minutes or more connect time, depending on the day and hour.
THE SOURCE and **AMERICA'S INFORMATION UTILITY** are service marks of Source Telecomputing Corporation, a subsidiary of The Reader's Digest Association, Inc.
 ©1983 Hayes Microcomputer Products, Inc.

CIRCLE 300 ON READER SERVICE CARD

A large group of diverse people are gathered around a green casino table, possibly craps or roulette. They are all smiling and looking towards the center of the table, where a croupier's hand is visible. The atmosphere is lively and social. The background is dark, focusing attention on the players and the table.

Success!
More than blind luck.

Many people believe you'll lose if you gamble. However, skillful gaming strategy, combined with intelligent money management, can make you a winner at any casino.

With Casino Master and your home computer, you can now learn successful, proven techniques and strategies for seven of the most popular casino games. Choose from 21 Blackjack, Craps, Roulette, Poker, Baccarat, Keno, or even Slots.

Casino Master accurately simulates each game in full color graphics with exciting animation and realistic sound effects. Comprehensive rules for each game can be displayed with a single keystroke

and all the playing opportunities you'd find at the casino are available.

Casino Master, more than an elaborate computer simulation, helps you develop winning skills for each game. Casino Master interactively follows you through each gameplay and, at your option, will provide you with instructional suggestions for the next bet or play decision. At any point you can display continuously updated statistical evaluations. Casino Master monitors your performance so you can refine your strategy and get the feedback you need to win.

CASINO MASTER™ \$34.95

California residents add 6% sales tax.

STARFIRE GAMES, Division of Omnisoft Corp.
Dept. L32, 9960 Owensmouth Avenue, Suite 32
Chatsworth, California 91311

Available for: IBM PC and XT (requires 1MB disk space, color monitor, and color graphics adapter; IBM PC and XT versions both supplied); Apple II (requires Apple II Plus or IIe and Apple II disk drive); Commodore 64 (requires cassette or disk drive); Atari 2600, 400, and 800 (requires Atari 2600, 400, and 800 versions soon to be released).

Photo courtesy of the MGM GRAND HOTEL, Las Vegas

IBM, Apple, Commodore, Atari, and Tandy-80 are trademarks of IBM Corp., Apple Computer Inc., Commodore Business Machines Inc., Atari Inc., and Tandy Corp., respectively.

YES! Please rush me CASINO MASTER™

for the: ☐ IBM ☐ Apple ☐ Commodore 64 computer.

Enclosed is my ☐ check ☐ money order for \$34.95

Name _____

Street _____

City _____ State _____ Zip _____

STARFIRE GAMES, Division of Omnisoft Corp.
Dept. L32, 9960 Owensmouth Avenue, Suite 32
Chatsworth, CA 91311

California residents please add 6% sales tax

CIRCLE 293 ON READER SERVICE CARD
CIRCLE 130 ON HEADSET SERVICE CARD

SandStar™ Modular Technology That Will Never

SandStar™ Cards and Modules are the first IBM®-compatible peripherals engineered to be totally Modular. The ingenious design of the SandStar™ Series has virtually eliminated problems of board obsolescence and running out of expansion slots. Say good-bye to single function or "super" boards which either give you too little or too much. Now you can purchase the functions you need as you need them!

HERE'S HOW IT WORKS.

If you just purchased an IBM PC 64K System without a floppy drive controller board, for example, instead of purchasing a board which performs just this function (and takes up one expansion slot!), install a SandStar™ Floppy Drive Controller Card which itself has expansion slots for three SandStar™ Modules! At any time you can expand your capabilities by adding serial communications with the SandStar™ Serial Port Module; or the SandStar™ Parallel Port Module will give you the capability to add a matrix printer. And you still have room to add another function, like our SandStar™ SASI Host Adaptor Module or Clock Calendar card slot. And with the SandStar™ Multifunction Card, there's room for six modules. That's flexibility! As new components are created, the beauty of SandStar™ Cards and Modules is that they will never obsolete themselves. Their flexibility will allow you to add and interchange modules for years to come.

INSTALLATION IS EASY.

Each of the SandStar™ Modules is designed with a standard I/O interface. The module simply plugs into any of the SandStar™ Cards. All SandStar™ Cards and Modules come with easy to follow instructions. No technical expertise is required.



SandStar™ Multifunction Card
Configure your card with as many as six SandStar™ Modules. As with all SandStar™ Cards, all modules function independently.



SandStar™ 5¼" & 8" Floppy Drive Controller Card
Control up to four 5¼" floppy drives or two 8" drives externally. This Card accepts up to three SandStar™ Modules.



SandStar™ Game Adaptor Module
With this module you can attach up to 16 paddles or two joysticks. It may also be used for four digital inputs and four analog inputs. general purpose graphics applications. same type 15 pin "D" subminiature connector as the IBM Game Control Adaptor.

Technology or Obsolete Itself!

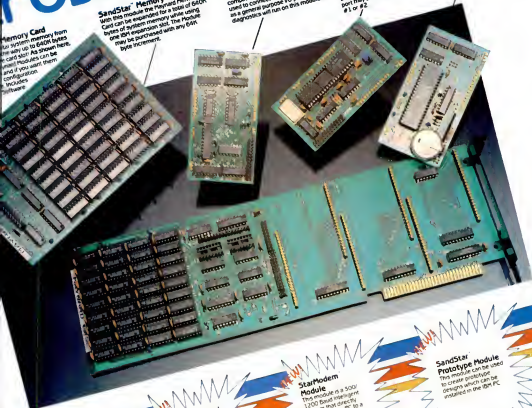
Memory Card
Your system memory from
the way up to 640K bytes
the card slot. As shown here,
when modules can be
and if you want, then
configuration.
Includes
software.

SandStar™ Memory Module
With this module the Maynard Memory
Card can be expanded for a total of 640K.
Modules of system memory while using
bytes of system memory slot. The Module
one disk expansion slot. May be
may be purchased with any 64K
byte increment.

**SandStar™ Parallel
Port Module**
This port is a Centronics™
compatible I/O port which may be
used to connect a printer or used
as a general purpose I/O port. IBM
diagnostics will run on this module.

**SandStar™ Serial
Port Module**
This module is totally compatible
with software written for the IBM
Asynchronous Adaptor and may be
used to connect to a PC2851, Serial
used to connect to a PC2851, Serial
standard PC2851/C interface. The
port may be configured as Serial Port
#1 or #2.

**SandStar™ Clock
Calendar Module**
This module automatically loads the
correct time and date each time the
system is powered up. The clock and
calendar are equipped with battery
power-up and run down when the
power is turned off. Software
included.



**SandStar™ SASI
Host Adaptor
Module**
This module interfaces
your PC to any SASI (or
SCSI) compatible device
such as the Amtek Hard
Disk Controller.

**SandStar™ Hard
Disk Controller
Module**
This module provides an
interface between your
IBM PC and the industry
standard ST 506 type
hard disk drives. Includes
ECC (error checking and
correcting).

**StarModem
Module**
This module is a 3001
1200 baud intelligent
modem that directly
connects your PC to a
telephone line using a
modem telephone jack.
Includes features such as
auto dialing and auto-
answer.

**SandStar™
Prototype Module**
This module can be used
to create prototype
designs which can be
installed in the IBM PC.

PRICED RIGHT!
All SandStar™ Cards and
Modules are competitively
priced. In the long run, the
SandStar™ Series will save
you money.

COMPLETE COMPATIBILITY
All SandStar™ Cards and Modules are designed to be 100%
compatible with IBM hardware, operating systems, high level
languages and diagnostics. They all come with a one-year
repair or replacement warranty and are ready to ship.

ASK YOUR DEALER
Look for the SandStar™ Series wherever quality
computer products are sold. Watch our ads for new
additions to the SandStar™ family.



MAYNARD ELECTRONICS
400 Semoran Boulevard
The Greater Mall, Suite 207
Casselberry, FL 32707 • 305/331-6402
CIRCLE 302 ON READER SERVICE CARD
We make modern times better.

Plug into 2.5 Mb of additional online storage.



FD-PC81 SINGLE DRIVE UNIT
FD-PC82 TWO DRIVE UNIT

The FD-PC8 is a new 8" double sided disk drive sub-system that adds an impressive 2.5 megabytes of online storage capacity to your IBM PC. Coupled with the 640 kilobyte capacity of the two 5 1/4" internal drives in your IBM PC, the system gives you enormous data base capability from the moment you plug it in!

CIRCLE 216 ON READER SERVICE CARD

IBM PC styling.

The FD-PC8 looks like your other IBM PC components. Same styling. Same color. Same dimensions. It stacks neatly under, on top of, or next to your IBM PC, and better still, is only one-half the height of standard 8" drives.

IBM PC and mainframe compatible.

Total interface capability with both IBM mainframes and PC affords new and unique data base flexibility and computing opportunities to the serious PC user.

Long life design features.

The FD-PC8 utilizes Shugart drives; the standard for quality and reliability in the computer industry. Unlike most disk drives, the motor runs only when selected, greatly increasing the life expectancy of the FD-PC8.

SPECIFICATIONS

- Full one year warranty on materials and workmanship.
- Two fully assembled and tested Shugart double-sided 8" drives also available in one drive configuration.
- Direct drive DC motor.
- Exactly 1/2 the height of standard 8" drives.
- IBM PC styled and painted cabinet.
- All cabling included.
- IBM 3740 format compatible.
- No-mar rubber feet.
- Sturdy construction easily supports PC or monitor.
- Power supply designed for long life, trouble-free operation.

PRICING

FD-PC8... dual system/\$1495.00... single system/\$1095.00
*Maynard Controller/\$245.00... JFormat/\$50.00

*Use of the 8" system requires the Maynard 8" controller and Tail Tree Systems' JFormat™ software, allowing the use of two internal 5 1/4" drives and the two outboard 8" drives.



FLOPPY DISK
SERVICES, INC.
741 Alexander Road
Princeton, NJ 08540

IBM PC is a registered trademark of International Business Machines Corporation.
Maynard Controller is a registered trademark of Maynard Electronics.
JFormat is a registered trademark of Tail Tree Systems.

Plug into the perfect IBM PC add-on!

For more information about the FD-PC*, call (609) 799-4440.
Or call our toll free order line at (800) 223-0306.
Dealer inquiries invited.

CMO
1/27/88, Jan

YOU'VE GOT TO SEE IT TO BELIEVE IT

Consolidated Profit and Loss Projections (Outlines in Thousands)

	Jan84	Feb84	Mar84	Apr84	May84	Jun84	Jul84	Aug84	Sep84	Oct84	Nov84	Dec84	Total 1984
Revenue:													
Components Div.	186	215	225	250	215	268	225	428	548	645	725	255	3610
Micro Systems Div.	18	25	40	75	218	185	225	225	225	225	225	225	1610
Industrial Sys. Div.	25	25	50	75	180	130	140	190	225	250	340	250	1870
Total Revenue	229	265	295	395	613	583	670	843	1093	1120	1290	730	10090
Cost of Sales:													
Components Div.	80	70	180	110	175	165	210	245	290	405	525	605	2415
Micro Systems Div.	15	25	40	75	218	185	225	225	225	225	225	225	1610
Industrial Sys. Div.	25	25	50	75	180	130	140	190	225	250	340	250	1870
Total COG	120	120	270	260	573	480	575	660	740	880	1090	1080	6900
Operating Expenses:													
Components Div.	180	175	270	170	175	200	200	200	205	200	200	170	2025
Micro Systems Div.	75	75	75	100	100	110	110	110	115	110	110	110	1000
Industrial Sys. Div.	50	65	75	75	145	100	100	105	110	105	100	100	1000
Total Op. Exp.	305	315	320	345	420	410	410	415	420	415	410	380	4025

Introducing IBM PC-Compatible Hardware To Run Spreadsheet Software

It should be a simple thing, really, to see a full 132 column spreadsheet on your IBM PC. You shouldn't have to scroll up, down and sideways to get the full picture. Now you can see it all with **SuperVision**, a monochrome video interface board from **California Computer Systems**. It easily replaces your

IBM PC monochrome board. In addition, SuperVision offers a full 132 column by 44 row screen, a printer port, and 720 by 348 dot addressable graphics capability.

SuperVision supplies the features that have been missing for spreadsheets, financial modeling, and database applications as well as giving you a fast, full-screen editor to make life easier. **Z/Plus**, a fast Z80B based card with CP/M and a

full 192K of parity RAM is also available for your IBM PC.

Call CCS today and get the **FULL** picture.
(408) 734-5811



California Computer Systems

250 Cambean Dr., Sunnyvale, CA 94086
(408) 734-5811 Telex: 171959 CCS SU/L

SuperVision and Z/Plus are trademarks of C.S. Inc. IBM is a registered trademark of International Business Machines. CP/M is a trademark of Digital Research Inc. Z80B is a trademark of Zilog, Inc.



The fortresslike IBM headquarters. The company's tight security is renowned.



IBM EYE/MARTIN PORTER

The powerful presence of IBM has changed a Florida town's fortunes and its nickname—from Fountain of Youth to Silicon Beach.

The Talk Of BOCA

"IBM creates the environment . . ."
from *The Soul of a New Machine*
by Tracy Kidder

The midnight traffic heading north on I-95 to Boca Raton sizzles at 85 mph. The engine noises are absorbed by the barren plain of palm trees, warehouses, condos, and billboards. Two of those billboards are emblazoned with enough wattage to light a night game at Dolphin Stadium. They have been carefully situated on both sides of the highway so that they are impossible to miss: "Isn't It Time You Moved To Boca?"

The billboards are adorned with the avant-garde logo of the real estate developer that has the most to gain from any such

relocation—Arvida Corporation. This subsidiary of Penn Central owns Boca Raton's most desirable residential and commercial properties. Its holdings date from the early 1920s when no one in his right mind would have wanted to live down here.

People want to live down here now. This is southern Florida, land of the snowbird and retirement center of America. And, not so incidentally, one of the high-tech boom centers of the United States.

The clean and inconspicuous computer industry is setting the region's "fountain of youth" in motion. Those companies that installed whirlpools for arthritis sufferers years ago now are making a liv-

Isn't it time you moved up to Boca?

Boca West/Town Place/Millpond

ARMDA

BEAL

Newcomers to Boca Raton are greeted by a duo of floodlit, eye-catching billboards.

ing selling hot tubs. Though Red Buttons once brought thousands of retirees down from Brooklyn to Boca Raton with the lure of a \$45,000 condo in Century Village, Arvide has its eye on bigger game—multinational corporations and their high paid executives.

Some people are starting to call the area Silicon Beach, in deference to the great valley of the West. Mitel, Siemens, Sensormatic, Harris, and Datamedix have all set up headquarters here. And, of course, there is IBM. Not just any IBM office building, mind you—the company is everywhere—but the IBM Entry Systems Division: the kingdom of the PC.

Undoubtedly, IBM's presence brought the high-tech copycats flocking to Boca. It was IBM that gave credibility to the hype issuing from Boca Raton's Chamber of Commerce. Arvide may own all the land, but IBM made it valuable.

Which IBM?

The late-night traveler to Boca will have a hard time finding the IBM compound. Not that it is hidden; in fact, it is right off the interstate. But there is nothing to draw your attention to the fact that the country's most profitable company has its most expansive profit center situated right under your nose.

A swing off the interstate in search of IBM turns into an opportunity for map-buying and tank-refilling at a Citgo station serving everything from unleaded gas to barbecued chickens. A teenaged girl behind the register counts out my change and doesn't look up when I ask the way to IBM. "Which one?" she replies.

It turns out that there are 20 IBMs in Boca Raton and the surrounding beaches of Delray, Deerfield, and Boynton. All are involved in some aspect of research and development, manufacture, and management of the Specialty Products Division and the Entry Systems Division, which

BEFORE
IBM, Boca Raton was undeveloped farmland supporting crops of pineapples and beans. The only residents were sharecroppers and Japanese farmers.

recently gained full divisional standing.

Long before the IBM PC brought the world's attention to Boca Raton, the company was here making minis. In fact, it was in Boca that the elephant first learned how to tap dance with its minicomputer market entry, the Series 1. Today, IBM employs 6,800 people in Boca, owns over 650 acres of land, and leases an additional 1.5 million additional square feet of office space. The company doesn't need to draw attention to itself (it doesn't even have a boldface listing in the local telephone

book); everyone knows IBM is here. Before IBM, Boca Raton was undeveloped farmland supporting crops of pineapples and beans. The only residents were sharecroppers and Japanese farmers. Before IBM, all that Boca Raton had to brag about was a playboy's fantasy of the ultimate luxury resort: the Boca Hotel & Club. This 1920s building remains the architectural landmark of the city. But the structure that really deserves to be studied by those interested in the city is the corporate headquarters that architect Marcel Breuer designed for IBM.

In 1967, the year that IBM acquired acreage belonging to a Japanese farmer named Yamato (the facility is situated on Yamato Road), the firm of Breuer and Associates began construction on two Y-shaped buildings surrounded by a man-made lake. Breuer probably is better known for his chairs than for his buildings, but, as a founder of the Bauhaus school of design in the 1920s, he is regarded as one of the leading architects of this century. His buildings were the first to become part of the surrounding landscape. They made no spectacle of themselves.

Corporation of the Future

Breuer had an opportunity to test out his ideas on a grand scale when he was commissioned to build IBM's offices in LaGaude, France. The design was so successful that he was allowed to repeat it in Boca Raton. The theory behind both was that the corporation of the future would be more than just an office building; it would be an environment. It would be not only

The only Real Alternative for Tape Backup... + Davong

If you have
on IBM® XT
or have
added a hard disk
to your IBM PC, Davong
can give you a happier
future. Just plug in Davong tape
backup.

Davong tape backup can prevent
that sinking feeling that comes from losing data.
One disk malfunction or programming error
could wipe out a week's work, but not if you have
Davong backup.

The Davong streaming tape drive backs up any
Winchester disk drive used with IBM PC or XT
microcomputers. Each tape cartridge gives you up
to 18 megabytes (formatted) of safe, secure
storage.

Making makes it easy.

Utilities provide for initial checkout, copying
from hard disk to tape, and restoring files
from tape to hard disk. They also compare file
dates so that the most current file with the same
title is restored.

Protection plus. If you use a Davong hard disk
system under the Davong Multi-OS™ control
system, backup can be accomplished by volume
or individual file. A 15 megabyte disk can be
copied in about four minutes. Four error checking
methods ensure data integrity.

You can have peace of mind for only ~~\$274.95~~.* And
it's available from more than 800 Davong dealers.
Don't you deserve Davong backup.

Your IBM PC & XT deserve Davong.



217 Humboldt Court
Sunnyvale, California 94089
(408) 734-4900

© IBM is a registered trademark of IBM Corporation.
™ Multi-OS is a trademark of Davong Systems, Inc.
*Suggested retail price for standalone backup
tape drive with all cabling and adapters,
software utilities, comprehensive
documentation, and 180-day parts and labor
warranty. Also available for Davong hard disk
systems for only \$179.95.

REDUCED
NOW \$179.95-\$199.95
INCLUDING INTERFACE



COMDEX, LAS VEGAS, BOOTH #N1271

ONLY \$199.95 ON IBM PC & XT MICROCOMPUTERS

IBM and Microsoft

visually consistent with the landscape, but would also offer workers a retreat, with comfortable facilities in which to work and sufficient space in which to play.

The construction that Breuer built in Boca Raton has the solid, impenetrable aura of the Pentagon. The five-building complex has an architectural motif emphasizing soaring concrete columns. The grounds are lush, landscaped with black olive trees and pines rather than with native palms. The corporate dining room is evidence of Breuer's absolute control. When the building first opened, he wouldn't allow vending machines installed until they were covered with white, gray, and black vinyl to match the plant's color scheme.

Today, IBM has outgrown Breuer's buildings. Instead of expanding into the 500 additional acres it owns, it has preferred to lease office space throughout the city. One real estate agent told of a devel-

oper who built an office building with only one space commitment from IBM. By the time the building was ready to open, IBM decided it wanted the whole thing.

The environment concept that Breuer and other architects pioneered with commercial real estate has inspired Boca West, a self-contained residential enclave surrounding several golf courses and man-made lakes. There are no tract homes here. The average plot costs \$250,000, and there are \$3-million estates. The local BMW dealer does very well, thanks to the folks in Boca West.

Arvide built Boca West. You thought only the micro-compatible and software manufacturers were feeding off IBM? Businesses like Arvide have been doing it for years.

Arvide was the biggest employer in Boca Raton in the late 1960s when IBM first came to town. Its empire consisted primarily of one building, the Boca Hotel & Club, which was constructed during the

Jazz Age and originally named the Cloisters Inn.

The Cloisters Inn was built by Boca Raton's founding father, Addison Mizner, a Palm Beach millionaire whose intent was to make the city the southern playground of the steamship set. At the time, the Inn was promoted as the most expensive 100-room hotel ever built. It cost \$1.25 million. The money came from Mizner's Palm Beach pals with last names like Vanderbilt and duPont. The Inn boasted in an early ad: "I Am The Greatest Resort in the World."

Arvide, with 3,700 employees, remains the second-largest employer in Boca Raton. The company closed on 1,100 homes last year and accounted for over \$235 million of Penn Central's 1982 earnings. The real estate firm's corporate pedigree dates back to its founding by Arthur Vining Davis (thus Arvide), former chairman of the board of the Aluminum Company of America (Alcoa). He once owned several

Left: Within Morcel Breuer's "corporation of the future," an environment for IBM employees to work and play in. Right: On the Boca waterfront, another playground for IBM employees.



MEET THE FAMILY.....



Baby Blue's Family!

BABY BLUE: CPM CO-PROCESSOR

This 2-80 microcomputer you plug into your IBM PC to gain instant access to thousands of CPM programs... languages, programming utilities, and the world's largest library of applications. Your CPM programs read and write PC-DOS files, so that CPM and PC-DOS programs can get down to business and share data with each other. And when you're not using **Baby Blue** to run CPM applications, its 64K of dual ported RAM is still there for your PC. Our **KEYFIM** utility exploits the power of your extended IBM PC keyboard. Single keystrokes can move mountains of text, or provide stock answers to often asked questions. **Baby Blue** also comes bundled with Micropro's **WorldStar/MailMerge**, ideally configured for the IBM PC keyboard, or with **InfoStar**, for high-speed, easy to use database management.

Baby Blue	\$600
Baby Blue with WorldStar/MailMerge	\$995
Baby Blue with InfoStar	\$895

BABY TEX: CPM CO-PROCESSOR

Baby Tex brings CPM program capabilities to the Texas Instruments Professional Computer, with all the features of **Baby Blue**.

Baby Tex	\$900
Baby Tex with WorldStar/MailMerge	\$995
Baby Tex with InfoStar	\$895

BabyTalk: MULTI-FUNCTION COMMUNICATIONS BOARD

BabyTalk is an intelligent communications management interface for the IBM PC, TI Professional and other bus-compatible microcomputers, designed to handle a full range of communications jobs. **BabyTalk** has an on-board 500/1200 baud modem (BELL 103, 202), an RS-232C serial port, a parallel port, a 2-80 Co-Processor with 64K of dual ported RAM and a realtime clock/calendar with battery backup. **BabyTalk** emulates V.270/Bisync, V.270/MSHA, V.270, V.2780, V.3770, V.3780 Bisync/Bisync, HASP/Bisync and a wide range of Async terminals including VT-32, VT-100 and IBM-3101.

BabyTalk	\$895
Some terminal emulation packages sold separately.	

LITTLE RED RAM: MEMORY BOARD

Little Red RAM plus is a 256K memory expansion upgrade for the IBM PC. With its P.D.Q. software, you can configure all or part of their memory to be used as a high-speed pseudo-disk drive. **Little Red RAM** comes with parity checking and is compatible with other memory boards. 64K, 128K & 192K configurations are all expandable to 256K.

Little Red (256K)

\$499

DISK CONTROLLER:

8" FLOPPY CONTROLLER & CONVERSION SOFTWARE

Our 8" Controller package (board and full-support software) gives you an 8" format utility, a CPM transfer program for CPM programs and data on large floppies, and optional **REFORMATTER** Conversion Software for transferring data between PC-DOS and IBM 3740 data format diskettes (with ASCII/EBCDIC translation) on your PC.

Disk Controller

\$395

Disk Controller with REFORMATTER

\$499

For more details contact your microcomputer dealer, or call us at (914) 368-0353.

Microlog
A TO INTERNATIONAL COMPANY

222 Route 59 Suffern, N.Y. 10901

CPM is a registered trademark of Digital Research, Inc. IBM is a trademark of International Business Machines Corporation. All other names are trademarks of their respective owners.

hundred thousand acres in the area.

Boca's Changing Face

Today, Arvida's emphasis is on industry rather than tourism. Its pet project is the Arvida Park of Commerce, an 800-acre industrial park exclusively for high-tech companies. The goal is to create a computer compound to rival North Carolina's Research Triangle. The Park of Commerce contains an 18-hole golf course, jogging paths, and lakes; it is conveniently situated directly across from IBM on Yamato Road.

IBM became the Park of Commerce's first tenant, and the company recently established its robotics headquarters there. The park, which closely resembles Breuer's IBM environment, is the first step in Arvida's plan to expand into 2,300 acres of untapped land to the north.

"The profile of Boca is really changing," explains Bob Ruf, Arvida's manager of marketing services. "Boca is getting too expensive for the retirees. It's probably too expensive for a lot of IBM employees. It is drawing a big professional crowd these days."

The high-tech firms are drawing that crowd, too. So are these Boca Raton Chamber of Commerce statistics: no state income tax; average income, \$34,500; average home value, \$181,000. Toss in that Boca is the winter polo capital of the world, has plenty of golf courses, good beaches and boating, and you can paint an alluring picture for an engineer who wants to unwind after a day spent with his head inside a microchip.

Although IBM has changed the face of Boca, the company's limited construction in the area has ensured its inconspicuous image. In addition, Breuer's original plan makes the corporate compound fit snugly into the landscape, and it is easy to miss the low-to-the-ground signs that announce the entrance and exits. But like any substantial newcomer, IBM took some getting used to.

In 1974, a local councilman proposed a two-fold ordinance that would limit IBM's expansion within the city limits in order to prevent overcrowding in the schools. In 1979, a lawsuit brought by environmentalists claimed that IBM's expansion was infringing on the area's original occupants, swamp rats and gopher tortoises. In both cases, IBM triumphed.

The company's future in Florida may

Q: HOW
do you maintain such tight security? A: Our employees know that the success of the company, and thus their jobs, depends on security. Apparently, they want to keep their jobs.

recently have encountered its toughest opponent and one that may reduce substantially the rate of multinational corporate expansion in the area. In late June, 1983, Governor Robert Graham, a politician with an IBM PC on his desk, signed the Unitary Tax Law, passed several weeks earlier by the state legislature in Tallahassee. Modeled after the California assessment plan, which passed the scrutiny of the Supreme Court of the United States, this Florida tax package is aimed at gathering an extra \$233 million in revenues for state schools.

The law is expected to cost IBM an additional \$5.8 million per year in taxes. According to Howard Davidson, general manager of the Boca Raton plant, "We couldn't just pull up and leave. But the state should know that the law will make us think twice about further expansion."

Running A Tight Ship

Davidson has been looked upon as the Boca Raton plant's leading authority since the ground-breaking announcement 15 years ago. It is he who impresses the need for security precautions upon employees; it is he who is writing an indignant letter to the governor about the Unitary Tax Law; it is he who represents IBM in more than a dozen community organizations.

Going to see him is like going to see anyone in the IBM complex. Each corridor is securely protected; entry is by pass-card only. Davidson's office is unassuming and comfortable, decorated with diagrams of ship hulls. His hair is whiter than it

appeared in the early mug shots that accompanied the news reports about IBM's move to Boca in the late 1960s. His answers to my questions are straightforward.

Q: How much did IBM pay for the land back in 1968?

A: About \$3,000 per acre.

Q: What is it worth today?

A: About \$250,000 per acre.

Q: How has the PC affected the operation down here? For example, how much have you grown because of the new product?

A: IBM doesn't give out figures like that.

Q: Is the company involved in local politics?

A: We'll lobby about issues we feel strongly about, but we don't get involved in party politics.

Q: Why does IBM keep such a low profile in town?

A: We don't want to be flamboyant.

Q: How do you maintain such tight security?

A: Our employees know that the success of the company, and thus their jobs, depends on security. Apparently, they want to keep their jobs.

Q: You seem interested in community activities. Have you donated any PCs anywhere in Boca?

A: IBM doesn't donate its equipment.

The PC Goes to School

IBM did give some PCs to the schools of Boca Raton, though the verb donate might not quite apply. While complaining about the new state school tax, IBM also seems eager to learn how the Personal Computer can fit in to the local secondary schools. Besides, the fact that nearby Broward County schools have become Apple country serves as a constant reminder of IBM's late start in the micro game.

The high schools of Boca Raton were selected by the Educational Testing Service in Princeton, New Jersey to be part of an IBM-sponsored national experiment in PC high-school training. In New York, California, and Florida schools, the \$8 million program is training teachers to use PCs. Each school receives 15 computers and a wide range of software. It is up to the educators to figure out what to do with the equipment.

The teachers at nearby Florida Atlantic University, who are in charge of the local PC training institute, are excited about the opportunity. Project director Dan Kauff-



The
LIME™

OUR LIMES ARE HELPING THE WHITE HOUSE COMMUNICATE!

The Lime™ is a surge protector from EPD.

Surges are fluctuations on the powerline that can happen at any time, causing downtime, data loss and permanent damage to computers, software and all microprocessor controlled equipment.

Limes keep the White House Communications equipment safe from the dangers of power surges that could damage or destroy it without warning. Electronic protection devices, like The Lemon™, The Lime™, The Orange™, and The Peach™, are at work all across

the nation in places like the U.S. Justice Department, Citicorp Bank of N.Y., Southwestern Bell, New England Telephone, Diebold Inc., Harvard University, and other leading organizations who know the value of expert protection.

Who's protecting your equipment from powerline problems?

Play it safe and go with the leader in surge protection that protects America's leaders. With EPD you're not only protected by the expert technology behind all of our products but by an insurance policy from Lloyds of London

that insures that protection. With EPD you're in good company.

DON'T PLUG IN WITHOUT US.

EPD

Electronic Protection Devices Inc.
P.O. Box 673, Waltham, MA 02254
(617) 991-6802 • 1-800-343-1813

CIRCLE 197 ON READER SERVICE CARD

men explains. "My impression is that IBM is seriously concerned about education in this country and decided it was time to do something about it."

In a classroom that has been converted for teacher training, Art Mitchell, head of the science department at nearby Atlantic

PC dealers throughout the country.

"I'd say that 50 percent of our business comes from IBM employees," Couch says. "Some of them even have Apples. Obviously, you have the very knowledgeable ones and then you also have those who don't know a thing about computers."

What about the IBM engineers? What is

it like to sell to somebody who already knows everything there is to know about the PC?

"To tell you the truth," he remarks, "I wouldn't know what any of my customers do at IBM. They don't talk about it." IBM people like to keep a low profile in Boca Raton. /PC

THE

PC rolls off the assembly line just outside of town, but that doesn't mean you'll find units with their prices slashed.

High School, is busy tweaking a question to a biology exam he developed using p/s File. He too lauds the opportunity IBM has given him, but adds, "IBM is going to get a tremendous amount of information in return for their investment. IBM doesn't do something like this for nothing."

Bargain Hunting

IBM doesn't give Boca residents any bargains, either. The PC rolls off the assembly line just outside of town, but that doesn't mean you'll find units with their prices slashed. In fact, because of the company's distribution network, it actually may take you longer to get a PC in Boca than it would in Burbank.

Take, for example, IBM employees who are eager to get involved in home, 16-bit tinkering. Each employee is allowed a 40 percent discount on a PC, which, for a while, was fulfilled through a nearby ComputerLand. The very workers who insert the boards had to wait for their units to leave Boca for the dealership warehouse to California and then return.

There are six authorized IBM PC dealers within a 10-mile radius of the IBM site. Jim Couch, who manages one of these dealerships, The Computer Center, explains that his PCs are first sent to Kentucky before they are shipped back to his customers here. He can offer no better than a 5 week wait, a lament common to

For Members Only

There are two PC user groups in Boca these days, but only one has an open membership policy.

Until last summer, there was only one IBM PC user's group in Boca Raton. That was the most famous user's group of all, the one limited to IBM employees, but this exclusive gathering is as verboten to outsiders as the IBM corridors are without a magnetic strip pass card.

It is not snobbery that keeps the group closed; the members just don't want to let anything slip. They are likely to be answering the user questions for products that haven't even been announced yet. Besides, the group is regulated by the same code of confidentiality that characterizes all IBM employee relationships within or without the city limits.

A typical encounter with an IBM employee at a Boca Raton cocktail party goes something like this:

"So where do you work?"

"IBM."

"Oh yeah, what do you do?" Silence. You might as well hit the wall during the Boston Marathon; the conversation is over.

The silence that IBM has been able to inculcate in its employee population is staggering. Not long ago, when computers were considered dull stuff that nobody really understood anyway, the questions were few, limited only to neighborhood stock market speculators. Today, everyone wants to know what is going on with the PC. They want to know about the Pea-odt and whatever else the company is getting ready to roll off the assembly line.

The fact is nobody knows any more about IBM in Boca Raton than they do any-

where else. It took two years for an outside PC user's group to get up steam here.

At a roundtable discussion, several members of this new, 60-member PC conclave talked about IBM, life in Boca, and especially what it is like to be a PC freak in the shadow of the beast.

"It's probably no different than anywhere else. Sure I know more people from IBM, and I might know a quicker way of finding things out. But, otherwise, there isn't much of a benefit," says a software developer in the group.

"That's not really true," counters someone else. "If you listen closely, and if you are good at putting two and two together, you can pick up a clue here and there."

Another voice: "I have a friend who told me, 'If you decide to buy an IBM PC during the next six months, I'll only let you know if you should or should not go ahead.'"

Yet another person adds: "I told a friend of mine that I was getting ready to buy an XT and he gave me one word of advice: 'Don't.'"

Lines of communication have opened between the users faction and their neighbors on the other side of the IBM fence. In fact, the members relate that the IBM employees have been going out of their way to help the group get started.

"Our hope is to become a major resource for PC user's groups throughout the country," says group leader Wyatt Bell. "We don't know everything, but at least we are closer to the source." —M.P.

**Now You Can Go
Swiftly and Painlessly
into Computer Technology
with the First and Only
Totally Interactive Learning System
in the World.**



**Learning with
Space Age Speed**

Fastrain™ takes the learning process on a rapid ride into the space age with the rest of the computer industry. It will have you in the know 70% faster than any other method.

Three Sense Worth

Our revolutionary Tri-Sensory Response™ method makes the difference. Sight, sound and hands-on application will guide you through the learning process as you operate your computer. Audio cassettes as well as diskettes provide guidance, as the Fastrain™ and you interact with the computer and synchronize what you see with what you hear at whatever speed is comfortable for you. No matter how easy you go we still get you there faster.

Guiding Light

As well as spelling it out on the screen and talking you through as you work the keys, the Fastrain™ has indicator lights that let you know when to respond, informs you of correct and incorrect responses, and even gives you the answers when you need them. A brief quiz at the end of each lesson is carefully designed to increase your retention and measure your progress.

The Complete Learning System

With the Fastrain™ unit you get an interconnecting cable to plug into your computer, and the learning package of your choice containing audio cassettes and diskettes. It's all you need to get on the Fastrain™ and make high-tech life easier with an idea whose time has come.



Electronic Protection Devices Inc.
P.O. Box 670, Weymouth, MA 02254
(617) 881-8800 • (800) 343-1810

CIRCLE 207 ON READER SERVICE CARD



Core
Performance
Productivity
System

Office Productivity

5000

ATI
Training
Power

Office Productivity

5000



BookbText

Put a FREE ATI Training Power under your Peachtree® this Season.

Buy PeachText 5000™ for only \$395. And you'll receive a FREE ATI Training Power valued at \$225.

Peachtree's bringing you an extra surprise this season! It's ATI Training Power instructional software for PeachText 5000—the complete personal productivity system.

PeachText 5000 combines word processing, financial modeling and analysis, mailing lists and simple data base management into one package. At one low price—\$395.00 retail. From Peachtree Software Incorporated.

And it's available for the microcomputers that are rapidly becoming the industry standard: the IBM Personal Computer™ and the IBM Personal Computer XT™.

PeachText 5000 is also available for the COMPAQ Portable Computer™, the Texas Instruments Professional Computer™, the Zenith Z-100™, the Eagle® PC, and the Eagle® 1600.

PeachText 5000 includes:

1. PeachText™ word processor—one of the best in the industry.

2. Random House Electronic Thesaurus™—installed in PeachText as a handy reference.

3. Spelling Proofreader—able to check a 10,000 word document in less than two minutes.*



*In actual trials using an IBM Personal Computer and 320K diskette, Spelling Proofreader checked a 10,000-word document in 1 minute and 15 seconds, using the standard 20,000-word dictionary supplied with the package. Checking times may vary depending on your hardware.

Copyrights Peachtree, PeachText 5000 and PeachText are trademarks of, and PeachCalc is a registered trademark of, Peachtree Software Incorporated, an MSA Company. ATI Training Power is a trademark of American Training International. IBM Personal Computer and IBM Personal Computer XT are trademarks of International Business Machines Corporation. COMPAQ Portable Computer is a trademark of COMPAQ Computer Corporation. Texas Instruments Professional Computer is a trademark of Texas Instruments Inc. Eagle, of the Eagle PC and the Eagle 1600, is a registered trademark of Eagle Computer, Inc. Z-100 is a trademark of Zenith Data Systems. Random House Electronic Thesaurus is a trademark of Random House Inc.

4. PeachCalc® electronic spreadsheet—designed for fast and accurate financial and mathematical analysis.

5. List Manager—gives you complete data management capabilities in a simple-to-use format.

For a Limited Time...

Here's what you get with your PeachText 5000 purchase.

—At participating dealers, you get ATI Training Power instructional software, retail value \$225.00. ATI Training Power instructs you how to operate PeachText 5000 in two or three hours. ATI Training Power instructional software is made up of simple, step-by-step instructions that appear on the bottom one-third of the screen. The top two-thirds of the screen simulates the PeachText 5000 program. It's one of the most effective ways of learning to use any software package. And it's specifically designed for PeachText 5000.

—Free 90-day technical support from Peachtree Software Incorporated.

Unmistakably Peachtree®

Who are the participating PeachText 5000 dealers in my area?



Name

Company Telephone

Address

City State Zip

©1983 Peachtree Software Incorporated An MSA Company
3445 Peachtree Road, N.E. / 8th Floor / Atlanta, Georgia 30326 / 1-800-354-8900

PC 11/83

CIRCLE 358 ON READER SERVICE CARD

Infoscope ... Its magic happens right before your eyes

Thirty minutes with your new computer and Infoscope, and you can be showing off — entering information, sorting it, displaying it, putting it to work in ways you never dreamed possible.

Infoscope, a revolutionary new program for dynamic information management, opens up the potential of the personal computer. It's usable and useful now even for a beginner, but it'll never get in the way in the long run.

From the first minute you use it, you'll discover some very interesting applications. It comes

with demonstration "scripts" and sample data so you can sit back and watch it do its stuff without doing a lot of tedious data entry.

Infoscope helps you create "Scopes" to display data — windows on the screen that grow, shrink, move around, and overlap, while showing you just the information you want to see.

As you work with it, Infoscope adapts to your level of expertise. Its "choice-driven" approach makes it easy for a new user to get up to speed, but it doesn't

entangle an expert in a maze of menus he doesn't want to see.

In short, Infoscope is as simple or as complex as you want it to be, and it does virtually any information management chore you want it to do.

But you have to see it for yourself. Infoscope is available for most popular 16 bit microcomputer systems. Ask for a demonstration at your local computer store, or write us for details.

Microstuff, Inc.
1845 The Exchange, Suite 140
Atlanta, Georgia 30339
(404) 952-0267



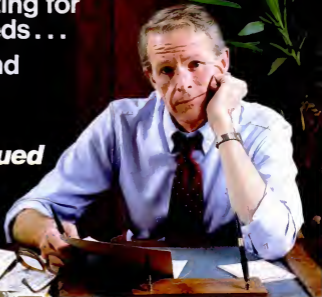
Infoscope is a trademark
of Viewview Corp.



Bob Wilson is waiting for
the reports he needs...

... and waiting, and
waiting, and
waiting...

He could be rescued
by **ResQ**™



ResQ is quite simply the easiest-to-use, fastest and most comprehensive information management system ever developed for the IBM Personal Computer. It was designed from the ground up to provide you with the exact information you need... only the information you need... in the exact form you need it... now!

Best of all, you don't have to know a thing about computers to take full advantage of ResQ almost immediately!

Like many other Data Base Managers, ResQ organizes, files, locates, controls and interrelates just about any kind of information. It prepares reports and mailing labels, is a general filing and reference system, handles customer records and inventories, tracks sales leads and follow-ups, and does the required calculating for any of these functions automatically. But that's where the similarity to other systems stops!

ResQ is the only system that allows you or a secretary to design your own forms and reports, create them right on the screen, then have them continuously available at the touch of a key! ResQ offers password protection to keep confidential information confidential, and does it on a number of different levels. ResQ reads, searches and sorts data faster than the fastest competitor we've tested.

ResQ's larger fields hold more information, and field sizes can be easily changed to increase your number of salesmen, products, files or reports. It allows for calculations on up to 8 levels of totals at report time, and interfaces with most popular word processing programs.



KEYSoftware Inc.

2350 E. Devon Ave., Suite 138
Des Plaines, Illinois 60018 • (312) 298-3610

The ResQ "How-To" Manual is written in plain, simple English—not like a scientific textbook in a foreign language! It was created for immediate use by clerical help who had never touched a computer before. It's been tested... and it works! As an added feature, "help screens" are always immediately available to answer questions for the user, without having to turn to the Manual.

We believe you'll be absolutely thrilled with ResQ and the way it prepares reports, manages information and solves your business problems. We're so certain that we offer ResQ with a 30-day money-back guarantee of satisfaction. You can try ResQ in your own business environment and prove its value for yourself... completely without risk!

That's a very remarkable offer... but ResQ is a very remarkable system!

Order ResQ through your local computer store, mail the coupon below or call...

(312) 298-3610



KeySoftware Inc. 2350 E. Devon Ave., Suite 138, Des Plaines, Illinois 60018

Please send _____ ResQ Software System(s) including diskettes and comprehensive, plain English Manuals at \$395.00 each including postage and handling. I understand I may return these materials within 30 days of receipt for a full refund if not completely satisfied.

☐ Check or Money Order enclosed ☐ Corporate Purchase Order enclosed

☐ Charge to my _____

☐ Visa ☐ MasterCard account

Exp. Date _____

Bank No. _____

(MasterCard only)

Name _____

Firm _____

Address _____

City _____

State _____

Zip _____

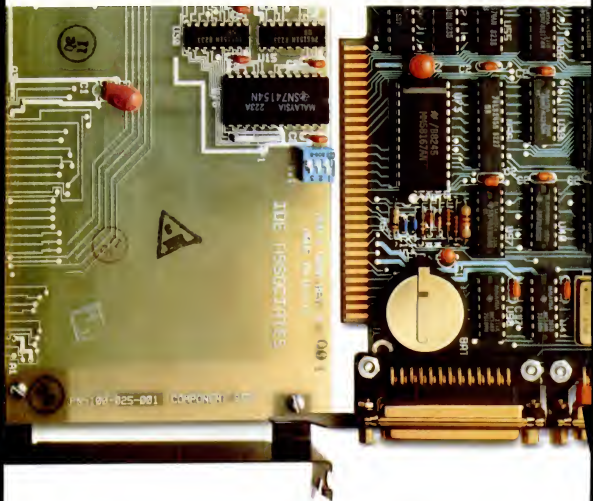
Signature ☒ _____

Requires IBM PC, with 128 K RAM or IBM XT, 2 disk drives, DOS 1.1 or 2.0. Update policy: Return your diskette at any time and Key Software, Inc. will replace it with the latest version for a \$20.00 fee.

CIRCLE 294 ON READER SERVICE CARD

P-4

T H E W I N D



**"After careful study,
we standardized on the IBM-PC. And the IDE line
was the only choice for our add-ons."**

— Randall B. Grossman, Management Analysis Center, Cambridge, MA

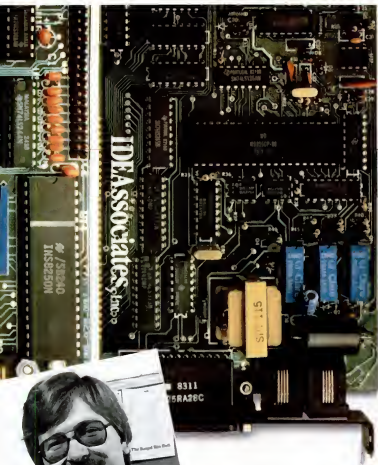
When Fortune 500 companies hire you to plan and implement top management strategies, you just don't have room for error. So when Management Analysis Center decided to standardize on add-ons for their IBM PCs, they wanted the most reliable, most integrated line of products they could find. Their choice? Significantly, IDE.

"We quickly learned that we wanted an IDE expansion board in every PC." MAC began by trying several other brands of add-ons—but things didn't always go as they were supposed to. All that changed when they discovered the IDEaplus Combination Card from IDE. Before long they were trying other IDE products. And soon after that, they were using all of our products simultaneously. With beautiful, trouble-free results.

"Now when we install an IDE board, I almost don't bother to test it." Of course, one reason people may feel they don't have to test our products is because we test them. Not just as components, but as integrated units—and for 100%.

*See all of IDE's products at COMDEX. Shown above, our IDEaboard Memory Card, IDEaplus Combination Card, IDEComm 1200 Integral Modem, and IDEadisk Winchester Disk Drive (available in 5MB-40MB capacities); plus our IDEashare and IDEanet disk sharing and networking products.

U T U N I D E:



See us at
COMDEX/Fall '83
 November 28-December 2, 1983
 Booth Number W948 West Exhibit Hall

of their functions. But product performance is only one side of our reliability...

"Their service is just superb. And we can count on it in all our offices nationwide." Support—that's the other side of our reliability. And you'll find plenty of it at IDE. Across the country, and internationally. It's the kind of support that will be there in the future, too, as our line expands.*

"When it comes to add-ons for the IBM PC, it just isn't worth going anywhere else." If reliability across a broad product line sounds like something you can use, give us a call at 1-800-257-5027 (in Massachusetts, call 617-275-4430). Or visit us at COMDEX November 28 to December 2. Either way, we'll get the word out to you on IDE.

IDE
IDE Associates

Better ideas for personal computers.

IDE Associates, Inc., 7 Oak Park Drive, Bedford, MA 01730

IDEAComm 3278 Mainframe Communications Card, IDEAmni I/O Card, and IDEAgraph family of graphics products.

Everything You Ever Wanted From Personal Computing Faster Easier

SOLVING PROBLEMS vs READING MANUALS

The real benefits of personal computing come from putting the hardware and software to work solving your business problems and not spending hours reading boring and tedious operating manuals.

PERSONAL COMPUTER BECOMES PERSONAL TUTOR

With Cdex Training programs you simply insert a Cdex diskette in your computer disk drive, turn on your computer, and in an instant your personal computer becomes your personal tutor.

TRAINING FOR PERSONAL COMPUTERS: COMPREHENSIVE TRAINING PROGRAMS

- How to use your IBM® personal computer with PC DOS — PC or XT
- How to use your IBM® personal computer with CPM86 or Concurrent CPM86 — PC or XT
- IBM® PC communications using the IBM® PC Asynchronous Communications Program
- IBM® PC DOS 2.0
- How to use your Apple® IIe personal computer

REFERENCE GUIDE INCLUDED

In addition, each Cdex program comes with a Reference Guide that contains keyboard and/or command references for the pertinent hardware or software so that you can use it later to refresh your memory.

TRAINING FOR PERSONAL COMPUTER SOFTWARE:

- Advanced Training for the Lotus 1-2-3 Program
- The Lotus™ 1-2-3 Program
- The MULTIPLAN™ Program
- The VisiWord™ Program
- The VisiTrend™ and VisiPlot™ Program
- The TK 1 Solver Program
- The MultiMate™ Program
- The VisiCalc™ Program
- The WordStar™ Program
- The SuperCalc™ and SuperCalc2™ Programs
- The EasyWriter™ II Program
- The dBase II® Program
- The DB Master™ Program — Version 4

TRAINING FOR PERSONAL COMPUTER ACCOUNTING SOFTWARE:

- The BPI® General Accounting Program
- The State of the Art® General Ledger System
- The Peachtree General Ledger System

TRAINING FOR BUSINESS PRODUCTIVITY USING PERSONAL COMPUTER SOFTWARE:

- "Managing Your Business Using Electronic Spreadsheets"
 - "Making Business Decisions Using Electronic Spreadsheets"
- These programs are for users of the Lotus™ 1-2-3 Program, MULTIPLAN™ Program, VisiCalc™, VisiCalc IV™ or VisiCalc™ Advanced Version Programs, or SuperCalc™ or SuperCalc2™ Programs

COMPETITIVELY PRICED

Surprisingly, given the above comprehensiveness of design and content, Cdex Training Programs are priced competitively with other computer-based training products that claim to provide training but only provide an introduction to training.

USABLE TODAY AND TOMORROW

With Cdex Training Programs you can use them today to train yourself on those features you need today and use them tomorrow to train yourself on the advanced features you need to implement sophisticated applications.

You get everything you ever wanted from personal computing. Faster and easier.

Cdex Training Programs are available for the IBM® PC or XT and IBM compatible personal computers, and the Apple II® Plus, Apple IIe and Apple III personal computers. See how effective a Cdex Training Program can be. Ask your computer dealer for a demonstration or call

(800) 982-1213

In California call (415) 964-7600.

cdex™

Cdex Corporation
5050 El Camino Real, Los Altos, CA 94022

Don't take it out on your hardware. The problem could be your software.



This photograph is a duplicate of the one appearing in an advertisement by Ashton-Tate, a competitor of Micro Data Base Systems, Inc.

Get KnowledgeMan. The all-in-one software with the data management edge.

Let's face it. Many 8-bit products like dBASE II weren't designed for the new generation of 16-bit micros. So you can't do all the things your application may require. With KnowledgeMan you won't be frustrated by typical 8-bit software limitations...so you can go easy on the hardware.

- *Need more than just 32 fields per record?*
KnowledgeMan allows you up to 255.

- *Wish you could use arrays?*
KnowledgeMan allows both one and two-dimensional arrays.

- *Need more than two tables open at once?*

KnowledgeMan allows an unlimited number to be open.*

- *Want security for your applications?*

KnowledgeMan provides password checking, field-level access controls AND encryption.

- *Wish you could use parameterized procedures and more than 16 levels of nesting?*

KnowledgeMan allows up to 26 parameters in a procedure, with UNLIMITED nesting.*

- *Want to take advantage of your terminal's color capabilities?*

KnowledgeMan supports up to eight colors.

That's just the beginning...KnowledgeMan is much more than just a relational data manager. It's a comprehensive system for

desktop information processing needs:

- Third Generation Spreadsheet
- Ad Hoc Inquiries (like IBM's SQL/DS)
- Screen I/O Management
- Forms Management
- Structured Programming Language

All are integrated so you can intermingle various kinds of processing with ease.

For example: You can query your data base from within the spreadsheet, and use the results in the spreadsheet's cells. With KnowledgeMan you'll solve MORE problems...pose MORE questions...simulate MORE "What-if?" questions.

For financial modeling, budgeting, sales reporting/analysis, billing reports, order entry, job costing and more, KnowledgeMan is the software to choose.

Easy to use. Powerful. And flexible enough to build your own decision support system. You can tie it together with MDBS III to create a distributed processing information center. You can even interface KnowledgeMan with your favorite graphics and word processing packages. And you won't have to worry about add-on features not included in the basic package. KnowledgeMan has it all.

So don't be seduced by dBASE II or other 8-bit products revamped to fit the 16-bit

environment. They're obsolete.

If you already own a copy, now's the time to upgrade —with KnowledgeMan.

*Depending on environmental constraints.

And Here's The Best News of All...You Get All These KnowledgeMan Features For Only \$500. First releases are for the IBM PC, Victor/Sirius, Altos. Call for other environments.

IBM, Altos, Victor/Sirius, and other names are trademarks of their respective owners.
Send check or money order payable to: Micro Data Base Systems, Inc., P.O. Box 248, Lafayette, IN 47902, (317) 463-2581, Altos: David Barbas.



**Micro Data Base
Systems, Inc.**

**KNOWLEDGE
man**
Great Software
Professional Support
Attractive Price
Big Profits

Name

Address

City State Zip

Phone ()

Operating System: ☐ PC DOS ☐ MSDOS ☐ CP/M-86

Machine/Disk Format: ☐ 5.25" IBM PC 5.25 ☐ 5.25" Victor/Sirius

☐ 5.25" IBM 3740 56-50

192K RAM & 500K mass storage recommended.

Handling/Shipping: Add \$10 for U.S., Canada, Mexico;

\$45 elsewhere. Indiana residents add 5% sales tax.

VISA/MasterCard orders may be placed by phone.

☐ Check/money order enclosed (U.S. currency).

☐ MasterCard/VISA No.

Exp. Date Bank No. if MC

Signature

☐ Dealer: Ask for Dealer Demo Package:
KnowledgeMan, MDBS III are Trademarks of Micro Data Base
Systems, Inc., SQL/DS, PC of IBM, Victor/Sirius of Victor
Systems, Altos of Altos Computer Systems, MSDOS of
Microsoft, CP/M of Digital Research, dBASE II of Ashton-Tate.

☐ Dealer: Ask for Dealer Demo Package:
KnowledgeMan, MDBS III are Trademarks of Micro Data Base
Systems, Inc., SQL/DS, PC of IBM, Victor/Sirius of Victor
Systems, Altos of Altos Computer Systems, MSDOS of
Microsoft, CP/M of Digital Research, dBASE II of Ashton-Tate.

☐ Dealer: Ask for Dealer Demo Package:
KnowledgeMan, MDBS III are Trademarks of Micro Data Base
Systems, Inc., SQL/DS, PC of IBM, Victor/Sirius of Victor
Systems, Altos of Altos Computer Systems, MSDOS of
Microsoft, CP/M of Digital Research, dBASE II of Ashton-Tate.

☐ Dealer: Ask for Dealer Demo Package:
KnowledgeMan, MDBS III are Trademarks of Micro Data Base
Systems, Inc., SQL/DS, PC of IBM, Victor/Sirius of Victor
Systems, Altos of Altos Computer Systems, MSDOS of
Microsoft, CP/M of Digital Research, dBASE II of Ashton-Tate.

☐ Dealer: Ask for Dealer Demo Package:
KnowledgeMan, MDBS III are Trademarks of Micro Data Base
Systems, Inc., SQL/DS, PC of IBM, Victor/Sirius of Victor
Systems, Altos of Altos Computer Systems, MSDOS of
Microsoft, CP/M of Digital Research, dBASE II of Ashton-Tate.

☐ Dealer: Ask for Dealer Demo Package:
KnowledgeMan, MDBS III are Trademarks of Micro Data Base
Systems, Inc., SQL/DS, PC of IBM, Victor/Sirius of Victor
Systems, Altos of Altos Computer Systems, MSDOS of
Microsoft, CP/M of Digital Research, dBASE II of Ashton-Tate.

**FIRST
FROM
TECMAR**

**NEW
REMOVABLE
CARTRIDGE
WINCHESTER**

Write for new Tecmar Information Kit.

TECMAR

Personal Computer Products Division
6225 Cochran Road
Cleveland, Ohio 44139
Phone: 216-349-0600/Telex: 466692

CIRCLE 497 ON READER SERVICE CARD

**TECMAR
\$1795.⁰⁰**

complete with
controller & cartridge

This is the breakthrough in storage that IBM PC people have been waiting for, as Tecmar engineering keeps you moving ahead.

- the new SyQuest 5 Megabyte removable cartridge Winchester disk drive
- complete, easily installed in IBM PC or available in IBM-compatible Tecmar expansion chassis
- new Tecmar superspeed controller
- Tecmar disk sharing for up to 4 IBM PCs
- your best solution for mass storage, and the most sensible back-up system available.

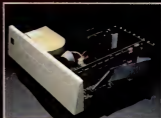
We believe this is the future in storage because we have proved its reliability and its advantages. The new removable cartridge gives you unlimited memory at a lower price tag than the basic Winchester at comparable speed.

\$1795 complete with
controller & cartridge
AVAILABLE NOW AT YOUR TECMAR DEALER



**TECMAR COMPATIBILITY, VERSATILITY,
RELIABILITY, AFFORDABILITY,
RESPONSIBILITY**

The first and only complete line of fully compatible expansion options for IBM PCs, including every type of disk drive



NEW SHARED WINCHESTER PC-MATE™

Our new GT subsystem upgrades our original with 3 times faster speed, sharing for up to 4 IBM PCs . . . Controller Board available for upgrade on trade-in.



PC-MATE™ FLOPPY

Controller Board will handle 5 1/4" and 8" disks. Winchester can be installed in our floppy subsystem cabinet.

TECMAR'S GRAPHICS MASTER.™

It adds graphics to your IBM Monochrome Display, or 16 high-resolution colors to your color monitor!

NEW
IMPROVED!



Text or high-resolution graphics on the IBM Monochrome Display

Amazing new resolutions on standard color monitors

Complete emulation of IBM's display adapters

On standard low-scan color monitors:

- 640 horizontal x 400 vertical in 16 colors
- 720 horizontal x 480 vertical graphics in 4 colors.

On the IBM Monochrome Display:

- 720 horizontal x 700 vertical
 - 25/50 lines of 80 characters
- Graphics Master can do much more. In all, over 30 different display modes can be used on standard monitors, and over 25 on the IBM Monochrome Display.

With certain monitors, you can achieve super-high resolutions like 512 horizontal x 420 vertical in up to 16 colors without interface.



Graphics Master is equipped with a full 128K of on-board display buffer memory. In low-resolution modes, extra memory isn't wasted. You can divide it up into alternate display screens or use it for general data storage.

Graphics Master retains complete compatibility with the IBM Monochrome and Color/ Graphics Adapters. Use it to accompany or replace one or both of the IBM cards.

Graphics Master will run with all IBM software for the Personal Computer, including BASIC's graphics commands.

With Tecmar's Video Cassette Recorder Controller, you can overlay Graphics Master images on videotaped material with an external mixer.

Call or write for further information. Our new address is:

TECMAR

6225 Cochran Road
Cleveland, Ohio 44139
Phone 216-349-0600/Telex 466692
CIRCLE 501 ON READER SERVICE CARD

TECMAR'S AFFORDABLE INDUSTRIAL/SCIENTIFIC LINE FOR THE IBM PC

CONFIDENCE IS NO EXTRA CHARGE.

COMPATIBLE

All TECMAR products are designed to be fully compatible with each other and the IBM PC for smooth, trouble-free performance in your system.

SUPPORTABLE

Our philosophy of total support adds uncommon value to your TECMAR products. All TECMAR boards feature a one-year warranty, with guaranteed 72-hour maximum repair turnaround on all standard products. Replacement loaner units are available. Thorough and straightforward documentation comes with each unit. Our customer service staff is available to answer questions or solve your problems.

EXPANDABLE

Our products allow easy expandability, so your system capabilities can grow with your needs.

There's more! TECMAR's broad line of compatible IBM PC Industrial/Scientific products includes:

- High Resolution Graphics
- 5¼" and 8" Floppy Disc Controller
- Video Digitizer
- Video Cassette Recorder Controller
- Speech Synthesizer
- Voice Recognition
- D/A Converter
- Stepper Motor Controller
- EPROM or EEPROM Programmer/Reader
- Static RAM/ROM
- CMOS Memory



**IEEE488 INTERFACE
plus SOFTWARE**

**\$395
\$95**

Board implements IEEE488 industry standard to enable PC to operate as system controller or as an addressed talker/listener. Has DMA and interrupt capabilities. Available library of machine-language subroutines called from BASIC or FORTRAN for data transactions with SPIB. Order #20030 INTERFACE, #30030 SOFTWARE



LAB MASTER™

\$995

A sophisticated system that includes 16 channels of 12-bit A/D with a 30KHz conversion rate, two channels of 12-bit D/A, five timer/counters, and three 8-bit parallel ports. Options include programmable gain up to 1000, 14- and 16-bit accuracy, 40 and 100 KHz conversion, up to 256 channels. Order #20009.



LAB TENDER™

\$495

An economical and versatile system designed for data acquisition and control applications, with 32 channels of 8-bit A/D conversion, 16 channels of 8-bit D/A conversion, five timers, and three 8-bit parallel ports. Order #20028.



BASE BOARD™

\$345

Digital Input/Digital Output board with four sections of 24 D/I/O lines. Each section can be used as a stand-alone D/I/O interface or with a daughter board for prototyping or specific functions such as opto-isolated input or opto-isolated output. Order #20025.

We are proud to offer the largest line of options available anywhere for the IBM Personal Computer. All Tecmar products are designed with advanced technology as it becomes available. We add new products monthly, like the PC-MATE removable Cartridge Winchester drive. TECMAR offers complete reliability and backs it up with support.

TECMAR

PERSONAL COMPUTER PRODUCTS DIVISION
6225 Cothran Road
Cleveland, Ohio 44139
Phone: 216-349-0600/Telex: 480692

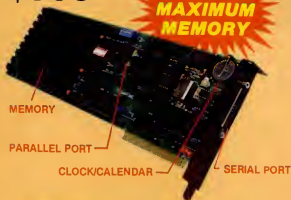
Call or write for the latest catalog of PC-MATE peripherals from TECMAR. Updated continuously as new products come on-line.



FIRST FROM TECMAR

\$795⁰⁰

**NEW!
MAXIMUM
MEMORY**



CAPTAIN™

Provides the entire maximum 384K memory expansion for the PC XT or 384K extra RAM for the PC

TECMAR'S TOP OF THE LINE MULTI-FUNCTION BOARD

Performs eight (8) key functions in one (1) expansion slot with upgradeable (expandable) memory.

- 0 to 384K **MEMORY** - fully socketed for easy field upgrade
- **CLOCK/CALENDAR** - with easily replaceable battery for back-up
- **SERIAL PORT** for communications — PC compatible (COM1, COM2)
- **PARALLEL PORT** for printer - PC compatible (LPT1, LPT2)
- **RAMSPOOLER** - easy to use - allows printing to become background task - choice of 8 memory sizes
- **SPEED DISK** - simulates ultra high speed disk
- **AUTO-TIME** - provides automatic insertion of date and time at power on
- Accepts exclusive **PAL Option** to restrict certain information on a "need to know" basis or to protect software
- Includes all connectors and cables
- Compatible with COMPAQ personal computer.



1st MATE™

\$319/Unpopulated Memory
\$389/64K \$469/128K
\$539/192K \$589/256K

Performe eight (8) key functions (same as the Captain).

Versatile - each 64K fully addressable.

These features are the same as described for the Captain.

- | | |
|-------------------------|---------------------|
| • MEMORY | • RAMSPOOLER |
| • CLOCK/CALENDAR | • SPEED DISK |
| • SERIAL PORT | • AUTO-TIME |
| • PARALLEL PORT | • PAL |



2nd MATE™

A wide range of I/O options - 4 ports with a clock/calendar when memory is not necessary.

- Two (2) **SERIAL PORTS** for communications, quality printers, modems — PC compatible (COM1, COM2 or other)
- Two (2) **PARALLEL PORTS** for printers — PC compatible (LPT1, LPT2 or other)
- **CLOCK/CALENDAR** with easily replaceable battery for back-up
- Accepts exclusive **PAL Option** to restrict information on a "need to know" basis or to protect software
- Two (2) cables - one (1) serial, one (1) parallel - included
- Compatible with TI Professional (requires special software) and COMPAQ personal computers

CIRCLE 49 ON READER SERVICE CARD

IBM UNLEASHED



Now you can move your IBM PC¹ from the fast lane into the jet stream. With the Personal Hard Disk[™] from Corona.

More power to you.

The Corona Personal Hard Disk really revs up your IBM PC, with none of the floppy bottlenecks, headaches and hassles.

You get 5 to 10 megabytes of storage.

Speeds up to ten times faster than floppy disc drives.

The high reliability of a hard disk.

In an easy add-on external package, or a convenient internal plug-in.

Lightning strikes twice.

If that's not enough, you also get a lot of the features of the Corona PC, our own 16-bit desktop and portable personal computer.

Like free RAM "disk." Just define blocks

of main memory as a disk and load your programs, then run them at incredible microsecond speeds.

Like disk partitioning that supports several operating systems at the same time, so MS-DOS², CP/M-86³ and Pascal are all right there when you need them.

Like simple menu operation that makes your PC friendlier than you would have believed possible. Small directories. Automatic backup. And much more.



All backed by Corona's exclusive DataGuard™ and FailSafe™ data protection systems for maximum reliability.

So if you're hungry for power and your IBM

just can't keep you fulfilled, get your hands on the Personal Hard Disk from Corona. It'll set you free.

The Personal Hard Disk is available in internal and external, 5 and 10 megabyte versions. For the name of your nearest Corona dealer, just call us toll-free at 800-621-6746. Or write Corona Data Systems, 31324 Via Colinas, Westlake Village, CA 91361. (213) 991-1144.



FEEL THE POWER.

© Corona Data Systems, IBM, 1 and IBM Corp.
2 and Microsoft, 3 are Digital Peripherals.

CIRCLE 204 ON READER SERVICE CARD

PURE POWER CONTROL CENTER



Power Directors incorporate UL approved Transorb™ semiconductor technology and exceed the 1983 IEEE-587 Guide for surge voltages in low voltage AC power circuits. So you can protect your computer system from line surges and noise, giving it the pure power it needs. Voltage spikes are stopped in less than a nanosecond, EMI/RFI line noise is filtered out, and current overloads are prevented. Now your system can be truly integrated with

central power control like the Model P12 shown above. Instead of a haphazard maze of power lines and extension cords, each component plugs into the fully shielded Power Director. You can turn on each component individually, or power up the entire system with a single switch.

Look for the full line of Power Directors whenever personal computers are sold. Transorb is a product of General Semiconductor Industries of Tempe, Arizona.



Computer Accessories Corporation, 7696 Formula Place, San Diego, CA 92121 (619) 695-3773

CIRCLE 280 ON READER SERVICE CARD

1611 Computer Accessories
Lighted 25007



CHARGE ORDERS—for your convenience,
PHONE TOLL FREE 800-526-0790. In New Jersey only 201-540-0445.

PC Poster Offer, CN 1914, Morristown, NJ 07960

Please send _____ prints of Mark McCandlish's "Inside the IBM Personal Computer"
@ \$10.00*each plus \$2.50 postage & handling. Outside USA add \$5.00 postage & handling.

☐ PAYMENT ENCLOSED \$ _____

☐ CHARGE: ☐ Visa ☐ MasterCard ☐ American Express

Card No. _____ Exp. Date _____

Signature _____

Print Name _____

Address _____

City/State/Zip _____

*Residents of CA, CO, CT, DC, FL, IL, MA, MI, MO, NJ, NY State, and VT add applicable sales tax.

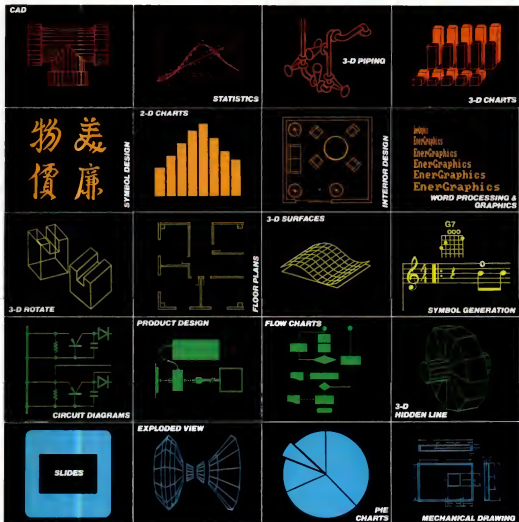
**Unique Art Poster Offer—A Cutaway View
of the IBM Personal Computer!**

24" x 32" poster, "Inside the IBM Personal Computer" by Mark McCandlish. Printed on quality heavyweight poster stock. Only \$10 plus \$2.50 for postage and handling.



NOW, 3-D ON YOUR PC

THE FIRST INTERACTIVE BUSINESS & 3-D GRAPHICS PROGRAM FOR THE IBM-PC*



*HARDWARE CONFIGURATION: IBM PC, e-xt, Dual Disk Drive, Graphics Adapter, Dot Matrix Printer. Also available for the T-RPC, Compact, and Vector.

FOR BUSINESS CHARTS, PRODUCT DESIGN, STATISTICAL ANALYSIS, CAD/CAE

ENERGRAPHICS™

FINANCIAL ANALYSTS, BUSINESS MANAGERS, ARCHITECTS, CITY PLANNERS, BUILDERS, DEVELOPERS, ENGINEERS (ELECTRICAL, MECHANICAL, CHEMICAL, AND CIVIL), PRODUCT DESIGNERS, SCIENTISTS, TEACHERS AND STUDENTS.

SEND YOUR CHECK FOR \$250 PLUS \$5 SHIPPING OR
\$15 FOR OUR DEMONSTRATION DISK OR SEND FOR
OUR DETAILED **ENERGRAPHICS** BROCHURE.
(VISA AND MASTER CARD ACCEPTED)
CALL 800-325-0174 EXCEPT MISSOURI

ENERTRONICS

Enetronics Research, Inc.
150 N. Meramec • Suite 207 • St. Louis • MO 63105 • (314) 725-5566
CIRCLE 228 ON READER SERVICE CARD

SUMO-TESTED

WOULD YOU BELIEVE 3 OUT OF 4 SUMO WRESTLERS RECOMMEND CASES BY COMPUTER-MATE™?

Neither do we. But it wouldn't surprise us. Because our cases are built with brute strength able to take a tough beating from even the mightiest challengers.

Stop wrestling with your IBM Personal Computer. With our cases, you'll have ease of transportation plus maximum protection for all your components. Standard cases available for CPU and keyboard, monitor, or full transport case designed to hold an entire system (CPU, keyboard, monitor, printer). Custom-built cases also available. For loss prevention, each case has a 3" x 5" personal identification frame and individual serial code with toll-free number. And like all Computer-Mate™ products, each case is pre-screened for excellence and backed with a 100% unconditional guarantee.



Chances are your IBM Personal Computer will never undergo a heavy bout with a Sumo wrestler. But with protection from Cases by Computer-Mate™, the odds are 3 to 1 your computer would win.

For order/information contact:

Computer-Mate, Inc.

1006 Hampshire Lane, Richardson, Texas 75080
Dallas (214) 689-9370 • Texas Residents (800) 442-4006
Out of State (800) 527-3643. Dealer inquiries welcome.

CIRCLE 104 ON READER SERVICE CARD

The author with the IBM 5100 family. From left to right: the SCAMP, the 5100, the 5110, the 5120, and the 5150 Personal Computer.



IBM EYE/PAUL J. FRIEDL

*IBM has been called a latecomer in the micro-business.
In reality, Big Blue invented the personal computer 10 years ago—
a little before the world was quite ready for it.*

SCAMP:

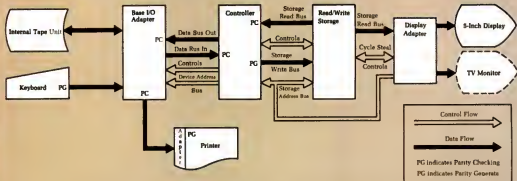


The Missing Link In The PC's Past?

The year 1983 marks the tenth anniversary of a milestone in the history of computing—the creation of SCAMP, the world's first personal computer. On this occasion it seems fitting to recall SCAMP not only as an IBM project and as a device, but also as a revolutionary concept.

Webster defines revolution as "a sudden, radical, or complete change" and evolution as "a process of continuous change . . . a progressive development." By these definitions, it appears that the concept of SCAMP was indeed revolutionary, whereas its realization as a device was evolutionary.

Figure 1: A diagram of the architecture used in the SCAMP.



During the heyday of centralized systems in the early 1970s, it was a radical change to consider building a system that could be operated by a single user, rather than requiring multiple users to approach a common shared system—one that rarely had sufficient ports, storage, or computing capacity available.

The notion of bringing computers to people was stimulated by several key trends at that time. Integrated circuit technology had become sufficiently advanced; high-level programming language technology had combined with interactive computing techniques to form systems such as APL, a very popular and powerful programming system. Why not combine these technologies into a portable personal computer that would free a user from some of the constraints of time-sharing systems?

The SCAMP Project

In January 1973, I presented IBM management with a design for SCAMP (Special Computer, APL Machine Portable) and a project plan to develop a prototype system. Afterwards, in Atlanta, Georgia, Jack Rogers, President of IBM's General Systems Division at the time, commissioned me to lead a project with the ambitious goal of developing a SCAMP prototype in 6 months. I had agreed to lead a fully-funded project to develop a revolutionary concept into a working prototype in a very short time, but I didn't have any people or resources to work with. Was I mad? (Moral: You should always be pre-

pared to take yes for an answer.)

Good fortune smiled down on this project throughout. Within the first 2 weeks, enough people with the needed skills were borrowed from other IBM groups to staff a hardware team in the IBM Advanced Systems Development Laboratory in Los Gatos, California, and a programming team in my laboratory, the IBM Scientific Center in Palo Alto, California. We were also fortunate to have as team

*I HAD
agreed to develop a
revolutionary concept
into a working
prototype in a very
short time.*

leaders our Chief Engineer, Joe George, and our Chief Programmer, Patrick Smith. These teams took the concept and formed the hardware, microcode, and software into the SCAMP prototype that we delivered on schedule to IBM Atlanta 6 months later.

An Evolutionary Device

The architecture of the SCAMP system was quite conventional, as is shown in Figure 1. The short time available for development meant that the system had to

be built from existing hardware and software components as much as possible. The thing that was new about SCAMP's hardware was its packaging—this unprecedented design has proved to be a missing link in the evolution of the personal computer. SCAMP represented a significant physical design departure from the systems at that time, in 1973, even though all of its components were quite conventional. Solid state technology then permitted sufficient compactness to allow the circuit cards for a microprocessor, 64 kilobytes of read/write memory, and device control logic to be packaged in the same frame as a CRT display, keyboard, and tape cassette drive. To make the system truly portable, all of the components were mounted in a set of covers, giving the unit the appearance of a small piece of luggage. This package is shown in Figure 2.

To operate the system, you placed the unit on its side, slid open a hatch cover, and popped the system into its raised position. A new high-frequency switching power supply was being simultaneously developed, but was not finished in time to be integrated into the system. Instead, a conventional standalone power supply was used throughout the SCAMP project.

The major system components were already available from various sources. For example, we selected a 5-inch CRT from Ball Brothers, Inc. for our display; a Norelco audio tape cassette recorder for a secondary storage device; a keyboard from IBM in Raleigh, North Carolina; 16 KB

HAYDEN INTRODUCES BILL OF MATERIALS SOFTWARE FOR COMPANIES WITH BIG NEEDS.



AND A SMALL COMPUTER.

Until now, if you had materials problems and didn't own a mainframe or a minicomputer, you were out of luck. Operations like repricing items as the price of component parts changed were a real headache. And making sure that all parts were on hand to complete an order was next to impossible.

That's because there has never been Bill of Materials software designed for microcomputers. Or wasn't, until now.

Big Bill of Materials Features for a Small Computer.

With Hayden's Bill of Materials for micros, now companies can get all the features of Bill of Materials software without spending up to \$10,000 for hardware. It's designed to work as a stand-alone product or as an upgrade to the Hayden Inventory system. Our menu-driven program easily allows even first-time users to simplify their materials problems.

Here are just a few samples of the time-saving and cost-efficient features included in Hayden's Bill of Materials software package:

- Provides both single-level and indented parts list reports.

- Supports up to 10 levels of subassemblies.
- Parts lists are automatically printed with current costs.
- Automatic recalculation of product cost using current component costs.
- Where-used report specifies all parts lists where a component is used.

Compatibility.

Hayden's Bill of Materials is compatible with Apple personal computers or any computer that can run CP/M, and will soon be available for IBM's Personal Computer as well.

Visit your local dealer and ask for a demonstration. You'll discover that finally there really is a Bill of Materials software package for micros. And you don't have to pay a big price to get it.



Bill of Materials

HAYDEN SOFTWARE

memory cards from IBM in Germany; support cards from IBM in Endicott, New York, and a PALM (Put All Logic in Microcode) microprocessor—not a chip, but a single board—from IBM in Boca Raton, Florida. (The insides of the SCAMP and a production model 5100 are exposed in Figure 3.)

The necessarily short development time had a similar effect upon our software plans; we knew we could not afford to develop a new APL language processor from scratch. The solution was, therefore, to emulate a processor for which a suitable APL system already existed. With this as a strategy, we chose to write an IBM 1130 emulator in PALM microcode so we could “plug in” almost all of version of APL that was available for the 1130. In this way, we were able to replace a programming effort of several person-years with one of several person-months.

ONCE YOU have a personal portable APL machine, what do you do with it?

What Is a Personal Computer?

While our hardware and program development teams blazed away at their respective activities, I had a chance to work on several other problems and questions. Once you have a personal portable APL machine, what do you do with it? How should applications be presented to the user? How could SCAMP best be han-

dled as a product? How could I get these concepts across to IBM management?

To the first question there were several answers. You could use SCAMP as a super desktop calculator, as an interactive APL programming device, and as a “dispenser” of canned application programs. Use as a calculator, though interesting, was not in itself persuasive, because the cost of the system seemed to far outweigh the value of this usage. SCAMP’s use as an APL programming device was much more appealing. The SCAMP, however, had to be sold to IBM’s high level management: executives who were not, in general, experienced APL users. It seemed that my best shot was to demonstrate SCAMP’s capabilities in the third area—as an application machine for non-programmers.

I believed that the computer should always direct interaction with the user by presenting questions along with the form

Figure 2: The original SCAMP folded into its suitcase-like frame (see inset). The upper part of the SCAMP, including the monitor, pops up when the system is to be used.





Every Executive Needs an Organizer Like T.I.M.[®]

Your valuable business information needs to be organized. T.I.M. can do it easily and quickly on your IBM-PC. As the executive's data base management system, T.I.M. makes it easy for you to assemble all your information so it can be ordered, changed or retrieved and then printed to suit a variety of circumstances. From phone lists through

complex sales reports, T.I.M. helps you put it all together using plain English commands — no programmerese to confuse you. Plus T.I.M. interfaces with all of the most popular word processing systems as well as powerful tools like Visicalc[®] ... T.I.M. is the executive's solution that's simple to use, easy to learn and pays off in bottom line efficiency for you and your

organization. For more information see your local IBM-PC dealer or contact Innovative Software for the name of the T.I.M. dealer nearest you.



developers of
practical
businessware for
the executive.

T.I.M. III is sold at Computerland[®], Sears Business Centers, The Xerox Stores, Computer Marts, Entre' Computer Centers[™], CompuShops[®] and other independent dealers.

9300 W. 110th St., Suite 380 • Overland Park, KS 66210 USA • 913/383-1089 • Telex: 209542

CIRCLE 271 ON READER SERVICE CARD

of possible expected answers, or a multiple choice menu. In addition, I felt it quite important to have a HELP facility that could be invoked at any time. Figure 4 shows the contents of the main MENU screen that I used when demonstrating SCAMP to IBM's management. This menu lists the types of applications that I believed might best suggest the wide capability of such a machine to my audience. Some screens demonstrating the HELP function and applications appear in Figures 5 through 7.

In spite of these efforts to prepare ways to show how easy SCAMP was to use, how could I be sure that an audience composed of inexperienced users would get this vital message? The solution hit me like a thunderclap—I would make my audience of managers operate the SCAMP hands-on! This may seem obvious, trivial, or old-hat to you now, but let me assure you that this was a revolutionary approach at the time. Many of my "victims" had not had recent typing experience, much less hands-on computing or programming experience. When demonstrating SCAMP to various IBM executives, I had no notion of how much pressure I'd be putting them under by asking them to execute what seemed to me to be a simple demo. Here I was, insist-

ing that they perform tasks that they had never done before, in front of their peers. (I hope all of these fine people have either forgotten or forgiven me.) The outcome, however, was superb—there were no system failures and my new set of no-longer-inexperienced users performed beautifully. I knew we had arrived when one of the executives said, "Gee, anyone should be able to do this."

There were still a number of challenging questions that needed answers. How

***MY BEST
shot was to
demonstrate SCAMP's
capabilities as an
application machine for
nonprogrammers.***

should such a product be mass produced? How should it be marketed, installed, and maintained? IBM's traditional methods and services, that support the larger com-

puters, did not apply here. Thus, as part of the SCAMP "package," a number of new approaches were proposed, including customer installation, machine problem determination by the user, and IBM retail stores. All of these approaches are, of course, commonplace today.

The Sons of SCAMP

As some of you may know, SCAMP soon became known as the IBM 5100 portable computer. This compact, stand-alone computer was announced to the world by IBM's General Systems Division on September 9, 1975. The initial prices ranged from \$8,975 to \$19,975. Succeeding generations were called the IBM 5110 and 5120 systems.

These machines were used in laboratories and universities; in medical, real estate, and insurance offices; even in drug stores, lumber yards, automobile showrooms, and cattle ranches. One joined the crew of an oceanographic research ship. Another accompanied President Nixon on his first trip to the People's Republic of China as a special "technical emissary." The 5100s went places computers had never gone before.

Now we have the IBM 5150, IBM's Personal Computer. The striking similarity of

Figure 3: The insides of the SCAMP (left) and a production model of the IBM 5100 (right).



From
\$229



MegaPlus II™

THE ULTIMATE EXPANSION FOR IBM® PC OR XT

This **really** is the only board you need to expand your IBM PC or XT. There is quite a selection of multifunction boards available today, with many of their manufacturers trying to pile up the score of so called "functions". But when you look to see what they do you find some real creative definitions of "function" as well as some pretty useless features. MegaPlus II has the features you need on a board that is cost effective, versatile, and reliable. You can start out with the basics as standard equipment, and can add features as the need arises. Or you can get it all right now — in one slot.

THE BASICS

MegaPlus II has three functions standard. Plenty checked and fully socketed memory up to 256k in 64k increments. clock/calendar with battery back-up. asynchronous communication port (RS232C serial) which can be used as COM1 or COM2. (DTE for a printer, DCE for a modem). Also included are: SuperDrive™ disk emulation and SuperSpooler™ printer buffer software. Optional is a 100% IBM compatible parallel printer port, and a second async port for another \$35 each. Both options are socketed so you can add them later should the need arise.

CLOCK/CALENDAR & CLIP-ON BATTERY

Our clock is powered by a simple \$4 lithium watch battery. It is clipped on, not soldered like some other clock boards. How useful is a battery warranty that requires you to send your board to the manufacturer to replace it? We send you a diskette with a program that sets the time and date when you turn on your computer. Now your programs will always have the correct time and date on them without you ever having to think about it. (Just which version of that program you were writing is the latest one?)



THE MEGAPAKS

The pictures show the optional 256k MegaPak™, the 128k version, and the new game pak. These boards mount "piggyback" on the MegaPlus II. The 256k MegaPak gives the old style PC's with only 64k the ability to add 512k of memory in one slot. The 128k MegaPak is for the new machines that can hold 256k on their PC's motherboard. This board along with the 256k on the MegaPlus II gives you the total of 640k, the maximum usable under 2.0 DOS. Now you can create disk drives in memory up to 360k, set aside plenty of space for print spooling, and still have plenty of memory for your biggest programs. There is a new game port MegaPak option. It uses any IBM compatible joysticks or paddles. It plugs onto the pin connectors just above the edge connector so you can add one even if you have one of the memory MegaPaks.

FREE SOFTWARE

SuperDrive™ disk emulation software creates "disk drives" in memory which access your programs at the speed of RAM memory. SuperSpooler™ print spooler allows the memory to accept data as fast as the computer can send it and frees your computer for more productive work. Both programs are compatible with 1.1 and 2.0 versions of DOS.

CHEAP SOFTWARE TOO

What good is great hardware without some great software to use it with? We offer some terrific prices on some of the popular programs you will want to use your board with. How about the cream of the spreadsheet programs, SUPERCALC®, for just \$159. Or maybe dBASE II by Ashton-Tate for just \$409. We now have the new standard for word processing programs, SUPERWRITER for \$179. It combines a very powerful, yet easy to use word processing program with a spelling checker and the ability to do mailing list/form letter generation.

WHY BUY IT FROM US?

Quality and Service. With over 100,000 boards in service AST Research is one of the leading suppliers of enhancements for the IBM PC. At Qube® we provide the service and support most companies just talk about. We realize how integral this board is to the use of your computer. What good is a warranty if it takes weeks for repairs to be made? We offer 48 hour turnaround or a replacement board on all warranty repairs. Do you hear anyone else making this promise? If you still are not convinced, and want to compare prices, remember, we don't charge extra for credit cards, or shipping. If you still want to buy elsewhere, ask them if they will face the acid test.

THE ACID TEST

Qube! [say cue-bee-A] gives you a 30 day satisfaction guarantee on all board purchases. If you are not completely satisfied we will refund the entire cost of your purchase as well as pay the postage to return it. If you can get one of our competitors to give you the same guarantee, buy any other board you think compares and return the one you don't like. We're not worried because we know which one you will keep. We also offer a one year parts and labor warranty. An additional one year extended warranty is available for \$50.

From
\$229

THIRSTY FOR 384k? HAVE A SIXPAKPLUS™

Since the introduction of PC DOS 2.0, the capabilities of the PC have been increased with the ability to address up to 640k of memory. With the current PC having 256k available on one computer motherboard, you need another 384k to reach 640k. Great you say, but multi-function boards only have room for 256k on them. Enter the SixPakPlus™. Not only does it

hold up to six banks of 64k parity checked RAM, but includes battery powered clock/calendar, serial port, parallel printer port, SuperDrive™, and SuperSpooler™ software standard. Optional is an IBM compatible game port. And of course you get the "Plus" of AST engineering and reliability, and the service and support of the largest dealer in the world for AST products.

WORD
PROCESSING
KEYBOARD



We have improved the touch and moved some keys to make for more "finger friendly" use of your IBM PC. The irritating key click is replaced with more positive tactile feedback. There are lighted indicators to the caps lock and num lock keys, and the left side shift key has been moved to its normal typewriter position. An enter key

has been added to the right of the ten key pad. We even put bumps on the F, J and 5 key of the ten key pad to help your fingers find the "home" position. The keyboard is 100% IBM compatible, just plug it in and type away! It will even work with PC keyboard compatible computers like Columbia

IBM PC WORKSTATION

Available color matched to the PC or in oak/black top and legs. This 24" deep table is designed specifically for the PC and is available in 26 inch and 32 inch widths. Table top and shelf are made of high pressure laminate. The desk is at typing table height for reduced fatigue. Optional casters allow the workstation to be easily moved from room to room. The 16" deep top shelf puts the monitor at eye level and provides a place for your library of manuals or printer without cluttering your workspace. (Printer is shown on top of the Printer Mate stand.) Durable steel construction and baked enamel textured finish assure many years of attractive, sturdy use.



TO ORDER

BY MAIL INCLUDE:

- complete description of products requested
- daytime phone number
- California residents add 6% sales tax
- check or credit card number with expiration date (personal checks take 18 days to clear)



TO ORDER BY PHONE:

In California (805) 482-9829
Outside California
TOLL FREE (800) 821-4479

PRICES:

I/O-Plus 2™ with Clock/calendar, serial (asynchronous) port, SuperDrive™ and SuperSpool™ - \$129

MegaPlus II™ no memory, with clock, serial, and software - \$229

SixPakPlus™ no memory, with clock, serial port, printer port, and software - \$229

Each 64k of memory installed and tested on MegaPlus, SixPakPlus or alone \$50
Parallel Printer Port \$35
Second Asynchronous Port \$35
Game Adapter (I/O or SixPakPlus) \$35

MegaPak™ with 256k of Memory \$299
128k of Memory \$199

GamePak for MegaPlusII \$40

ConnectAll Cable Bracket \$19

Cable to Parallel Printer \$35

Cable to Modem or Serial Printer \$25

Comprehensive Diagnostic Program \$10

Word Processing Keyboard \$229

Keyboard/Supervriter Package \$399

SUPERWRITER by Sorcim \$179

SUPERCALC™ by Sorcim \$159

dBASE II by Ashton-Tate \$409

PC Workstation (26" wide) \$145

(32" wide) \$160

Casters for workstations \$25

Small Printer Mate \$25

Large Printer Mate \$30

SHIPMENT

Normal shipment is day after receipt of order. We pay UPS surface charges on all items except keyboards. For keyboards add \$5 for surface, \$10 for 2 day air. All COD shipments add \$3 handling.

QUANTITY PURCHASES?

If your corporation, institution, or users group has needs for quantities of boards, call us for details on our quantity purchase program.

*IBM is a trademark of International Business Machines.

QUBIE' DISTRIBUTING

USA:
4809 Calle Alto
Camarillo, CA
93010

EUROPE:
Tempo House
15 Falcon Road
London SW11, UK

CIRCLE 379 ON READER SERVICE CARD

YOU ARE UNBEATABLE



WITH THE CYBERNETICS TWINS!!

...**REAL/COBOL**¹ and **RTI**². The combination provides a uniquely powerful set of business software tools.

REAL/COBOL IS THE MOST WIDELY-USED MICROCOMPUTER COBOL...and for good reason. Highly compatible across the widest range of micro/mini/mainframe computers, it is the language of choice for serious business applications. With the release of **REAL/COBOL** for the IBM mainframe machines (370, 30xx, 43xx), it is now possible to have compatibility over a truly huge range of computing power...from micros to mainframes.

RTI from Cybernetics (**COBOL** Reprogramming Tool) is a source program generator for **REAL/COBOL**, that can automatically produce a wide range of file maintenance, report printing, and other types of **REAL/COBOL** source programs. Programs produced by **RTI** provide a flexible alternative to many "database" software packages, since generated source programs may be modified for special requirements if desired. All source programs produced by **RTI** are, of course, the property of the user of **RTI**.

In addition to the Cybernetics twins, **REAL/COBOL** and **RTI**, we offer source program licenses for the most comprehensive microcomputer business applications...the MBSI Realworld³ software written in **REAL/COBOL**. Starting life as the minicomputer-based MCBA⁴ business applications, this software brings a new degree of professionalism to microcomputer applications.

Our software is available and supported for a wide range of microcomputer operating systems including CP/M⁴, CP/M-86⁴, MP/M⁴, MP/M-86⁴, PC DOS, MSDOS⁵, OASIS⁶, TRSDOS⁷, UNIX⁸, and RMICOS⁹. Contact us for details.

CALL NOW.
(714) 848-1922

Indicators of:
1 - IBM International Corp.
2 - Cybernetics, Inc.
3 - Micro Business Software, Inc.
4 - Digital Research, Inc.
5 - Microsoft Inc.

6 - Phase One Systems, Inc.
7 - Family Corp.
8 - Bell Telephone Laboratories
9 - Micro Computer Business Applications, Inc.

available for:

IBM	TEXAS INSTRUMENTS	NEC
TELEVIDEO	HEWLETT-PACKARD	DELTA
DIGITAL EQUIPMENT CORPORATION	TOSHIBA	
EPSON	HEATH	ONYX
XEROX	RADIO SHACK	COMMODORE
SHARP	SHARP	DAVEY
INTEL	CALIFORNIA COMPUTER SYSTEMS	COMING
DATA	MC PIONEER	PLATE
AMDESS	WESTERN	UNION

CYBERNETICS
N
C

8041 Newman Avenue
Suite 208
Huntington Beach, CA 92647
(714) 848-1922

Accept no substitutes.

If you're looking to buy a dBASE-like system, you'll really like dBASE II®

dBASE II is the relational database management system (DBMS) we introduced to the microcomputer world in 1980. It was the best, most powerful and easiest-to-use database management system available.

It still is.

You'll wonder how you managed without it.

Because it's so powerful yet so easy to use, dBASE II has become the standard for managing data with a microcomputer.

Doctors and lawyers, accountants and salespeople, stockbrokers and students, big businesses and small are all managing their data better with dBASE II. Books have been written about it. And other microcomputer data handling programs measure themselves against what dBASE II can do.

dBASE II turns data into a company resource.

dBASE II starts where file handling systems (such as our own Friday!™) leave off.

You get a running start on your business solutions because dBASE II includes a complete hands-on tutorial. You can quickly and easily create a full business information system because all of your data is at your fingertips. Using English-like commands, you add, delete, edit, display, print and manipulate your information.

Once you've decided on what you want done, you save the instructions so that even your least experienced personnel can perform the most complex business functions with two words: *Do Invoices*, *Do Payroll*, *Do* anything that needs to be done.

Your data and your programs are independent, so you can change one without changing the other; in fact, change the way you do business without destroying what you've done.

And dBASE II even simplifies conversion from your present system, and can handle data from other programs, or create files that other programs can use.



It's the most advanced information management tool available for your microcomputer. And it's only \$700 (suggested retail price).

The best selling DBMS known to man.

dBASE II struck a responsive chord in the business community when it was introduced and quickly became the best selling database management system made for any computer, micro or mainframe.

To see why, drop by your nearest computer or software store and ask for a demonstration. Then take a package home and use it for 30 days. If it's not everything we said it was, return it and get your money back.

But we think you'll keep it.

Can over 150,000 users be wrong?

Ashton-Tate, 10150 West

Jefferson Boulevard, Culver City,
CA 90230. (213) 204-5570.

ASHTON-TATE ■

©Ashton-Tate 1983
dBASE II is a registered trademark and Friday! is a trademark of Ashton-Tate.

A personal library for your



Best Sellers

Inside the IBM PC: Access to Advanced Features and Programming by Peter Norton



The most widely-read author on the IBM PC gives the reader a look inside the workings of the computer and the advanced features it can provide. This best

seller includes the fundamentals of the microprocessor, the operating system and PC DOS. In a very readable book, Peter Norton takes you beyond the machine, interprets its languages for you and introduces you to ROM.

1983/320pp/paper/ISBN 0-89303-556-4/\$19.95
Book/Diskette Package ISBN 0-89303-561-0/\$79.95

IBM PC: An Introduction to the Operating System, BASIC Programming and Applications, Revised and Enlarged by Larry Joel Goldstein and Martin Goldstein

An updated and expanded version of what has become the classic self-study book for the IBM PC. New chapters on BASIC emphasize the importance of structuring and planning programs and important new information on debugging. Games and graphics are included and the section on random access has been expanded. Includes DOS 2.0.

1983/448pp/paper/ISBN 0-89303-530-0/\$17.95
Book/Diskette Package ISBN 0-89303-527-0/\$39.95



IBM PC/XT Assembly Language: A Guide for Programmers by Leo J. Scanlon



An introduction to the fundamental principles of microprocessors (specifically the 8088), numbering systems, and assemblers. The book first outlines the

steps necessary to create and run assembly programs and then describes the entire instruction set of the 8088 microprocessor.
1983/364pp/paper/ISBN 0-89303-241-7/\$19.95
Book/Diskette Package ISBN 0-89303-535-1/\$49.95

Personal Computer

MS DOS and PC DOS: User's Guide by Peter Norton

Just
Published

The authority, Peter Norton, gives an introduction and explanation of the Microsoft Disk Operating System precisely right for the beginner. It provides examples and instructions not available in any other book. Just off the presses, MS DOS and PC DOS will be the next Norton best-seller.

1983/250pp/paper/ISBN 0-89303-645-5/\$15.95

Firsts

8087 Applications and Programming for the IBM PC and Other PCs by Richard Startz

New on the shelves and on the minds of 8087 microprocessor users, the pages begin with a non-technical introduction and turn into very detailed technical descriptions of the potential application. It includes sections on Advance Instruction Set, Non-linear methods, Statistical Analysis and Program Canning.

1983/250pp/paper/ISBN 0-89303-620-7/\$19.95



Communications and Networking for the IBM PC by Larry E. Jordan and Bruce W. Churchill



This book brings together data communications applications and the IBM PC. It includes asynchronous and synchronous communications and a complete

study of local area networking. A full chapter on communication codes and controls is included to demystify the language.

1983/225pp/paper/ISBN 0-89303-385-5/\$16.95

It's Basic

Handbook of BASIC for the IBM PC by David Schneider

This book for the layman presupposes no knowledge of BASIC and clearly translates the BASIC reference manual supplied with the IBM PC into completely comprehensible terms. Organized by BASIC programming statements, it allows the user to go directly to the desired information without confusion or delay.

1983/350pp/paper/ISBN 0-89303-506-8/\$19.95



IBM PC/XT Owner's Manual: A Practical Guide to Operations by Barbara Lee Chertok, Dov Rosenfeld, and James Stone



This entry level book provides easy instructions on the operations of the IBM PC. After reading this new guide with clear, concise examples, the PC user is up and running on the machine in a minimum amount of time—without programming classes.

1983/128pp/ISBN 0-89303-531-9/\$12.95

Advanced BASIC and Beyond for the IBM PC by Larry Joel Goldstein

A complete guide to the advanced skills of BASIC programming, files, graphics, event-trapping, machine language and subroutines. A must for the IBM PC programmer.

1983/400pp/paper/ISBN 0-89303-324-3/\$19.95
Book/Diskette Package ISBN 0-89303-325-1/\$39.95



Business

Business Problem Solving with the IBM PC & XT by Leon Wortman



with many also in Pascal.
1983/350pp/paper/ISBN 0-89303-282-4/\$19.95

Business Applications for the IBM PC by Steven Zimmerman and Leo Conrad

First time users will find this guide to the IBM PC ideal. It offers step-by-step instructions on the use and customization of existing business software programs.

1983/350pp/paper/ISBN 0-89303-243-3/\$17.95



Personal Interests

Games, Graphics, and Sound for the IBM PC by Dorothy Strickland, Dennis Rockwell, and Kevin Bowyer



This guide teaches how to program in BASIC, Pascal and FORTRAN to create graphics and sound for the IBM PC. It illustrates in 70 working examples how to

integrate sound and graphics into animation. And, it includes an example of how to create a simple video game.

1983/288pp/paper/ISBN 0-89303-169-X/\$18.95
Book/Diskette Package ISBN 0-89303-170-3/\$64.95

BASIC Engineering and Scientific Programs for the IBM PC by Philip Wolfe and C. Patrick Koelling

A source of BASIC programs written exclusively for on-the-job use by engineers and scientists to provide important computer techniques for problem solving and data manipulation.

1983/320pp/paper/ISBN 0-89303-330-8/\$19.95
Book/Diskette Package ISBN 0-89303-331-6/\$39.95



Pascal for the IBM PC: IBM DOS Pascal and UCSD p-System Pascal by Kevin Bowyer and Sherry Tomboulain



This is the first written word on combining the IBM PC and Pascal Programming. Soon it will be the last word for anyone who wants to break the limits of BASIC programming.

An emphasis on graphics and sound applications.

1983/320pp/paper/ISBN 0-89303-280-8/\$17.95

BRADY

Your publisher of books for the IBM PC

Brady IBM PC Bookware™ is available at Computerlands, IBM Product Centers, Sears Computer Centers, Entire Computer Centers, B. Dalton's, Waldens, Crown Books and other fine bookstores and computer retailers.

If you are unable to find the book of your choice call toll-free 800 638-0220 for information.

Robert J. Brady Co. A Prentice-Hall Company Bowie, MD 20715

CIRCLE 425 ON READER SERVICE CARD



The IBM Personal Computer with TRI-DENT. When a dentist wants to get personal.

Please send me the free booklet, "Everything a Dentist Ought to Know About Computers."

Name

Address

City

State Zip

Phone

Time to call

The most complete dental computer system in the world is TRI-DENT by Lear Data.

It is the answer to simplifying every business detail in your dental practice.

Dentists throughout the U.S. are depending on TRI-DENT because:

TRI-DENT gets out insurance forms automatically.

TRI-DENT improves cash flow. It issues monthly statements, even gives each patient a "walk-out" statement, speeding up payments by 30 days or more.

TRI-DENT can improve your reappointment record as much as 100% by integrating patient information to word processing. A nice touch: Some dentists "remember" birthdays and anniversaries using TRI-DENT.

TRI-DENT helps plan treatments.

Install TRI-DENT and suddenly you are in control of your practice. Business details are out of the way. You can spend all the time you want in the personal care of your patients.

And now, for the first time, TRI-DENT is available on the IBM Personal Computer with OASIS 16-bit operating system by Phase One Systems.

Don't delay the "computer decision" another day. For full information, call Lear Data, (707) 252-7139. Or, send for our free booklet, "Everything a Dentist Ought to Know About Computers." It tells all!



TRI-DENT
LEAR DATA, INC.
3259 California Blvd.
Napa, CA 94558

*TRI-DENT is a trademark of Lear Data, Inc.
*IBM is a trademark of International Business Machines, Inc.
*OASIS is a trademark of Phase One Systems, Inc.



"The Physicians' Office Computer is clearly superior. We've used it for years. It is 20 times more efficient than the manual method. You receive first rate performance and total support."

Theodore D. Johnson, M.D.
Los Angeles Neurological Center •
Los Angeles • California



"The Physicians' Office Computer is the best business investment I've ever made. The other systems simply aren't comparable."

Ed Williams, M.D.
Family Practice •
Lawndale • California



"Practice management is not the place to take chances. The Physicians' Office Computer software is extremely easy to use. The company is physician owned, they've been around for years and they're reliable."

W. Benton Boone, M.D.
Ophthalmology • Freeman
Medical Arts Center •
Inglewood • California



"The Physicians' Office Computer gives us complete control and allows us to manage the practice better than other methods. ... I recommend it to any physician who asks."

Harmon E. Schwartz, M.D.
Ear, Nose & Throat
Specialist •
Pasadena • California

OUR CUSTOMERS ARE OUR BEST SALESPEOPLE.

Nobody knows medical office computer systems like the doctors who depend on them every day. That's why so many doctors recommend Physicians' Office Computer™ software to their colleagues.

The Physicians' Office Computer software increases your efficiency and profitability. It quickly and automatically gives you any patient financial form and practice management report you're ever likely to need.

Our Physicians' Office Computer has proved itself for years in offices across the country as the best medical software.

We think you'll agree. Our customers certainly do. And they're our best salespeople.

Call us today or return the coupon below for more information.

"The Physicians' Office Computer has no real competition. It is, without a doubt, the medical office computer of choice."

Marc L. Platt, M.D.
Cardiology • Torrance •
California

Physicians' OFFICE COMPUTER™


Professional Systems Corporation
3858 Carson Street • Suite 220
Torrance • California • 90503
Telephone (213) 316-5345

☐ Please send me more information about the Physicians' Office Computer.
(Dealer Inquiries Invited)

NAME _____	SPECIALTY _____
ADDRESS _____	() _____
CITY _____	STATE _____ ZIP _____ TELEPHONE _____



How HP business graphics



Enhance your reputation for being more professional, persuasive, credible and effective than your competition with the new HP 7475A Business Professional's Plotter.

Make a first impression that lasts

The vital importance of graphics to today's business professional cannot be overstated. In survey after survey, statistics prove graphics can help you spot trends and relationships quickly, analyze data accurately, and communicate your ideas with more



clarity and power than in any other way.

Even more important, graphics can actually increase personal and company productivity. And create a first impression of quality and professionalism that lasts and lasts.

Graphics: the end to meetings that go nowhere

In a fascinating research project conducted by The University of Pennsylvania, 123 MBA candidates were involved in a study designed to test the effectiveness of business graphics in meeting situations. The results were startling. In the group where visual aids were used:

- Meetings were shorter: The study showed a 28% reduction in meeting length when transparencies were used.
- Group consensus was faster: Agreement was reached by 79% of the group using transparencies, compared with only 8% among the control group using no visual aids.
- The decision process was accelerated: 64% of study participants said they made their business decisions *immediately after the visual presentation*. When overheads were not used, the control group said they delayed decision-making until *some time after the group*

discussion following the presentation.

- Presenters with visual aids were perceived as being more professional, persuasive, credible and effective than those not using visual aids.

Now, with the new HP 7475A Business Professional's Plotter, your meetings can have immediate and productive results like these.

How the quality look of HP graphics can help

The way you present your information can be equally as important as the actual information you're presenting. And that's where the new HP 7475A Business Professional's Plotter lets your professionalism shine through.

Standards unsurpassed in the plotter business

The technical standards of the HP 7475A have no equal for producing quality graphics. With a resolution of one-thousandth-of-an-inch, curved lines are smooth, not jagged, and straight lines are consistently straight. Its exceptional repeatability (the ability of a pen to return *precisely* to a given point) assures that intersecting lines and circular shapes will meet *exactly*. The result is *high-quality* charts and graphs you'll be proud to present.

Why 6 pens when experts say 4 will do?

Graphics industry experts maintain that good graphics contain four colors per chart. But Hewlett-Packard goes the experts two better by providing a six-pen carousel, so you can store and use pens of different widths—thick pens for bold headings and thin pens for details. And with six pens, you won't have to waste valuable time changing them. That's important when "the boss wants to see your presentation in twenty minutes!"

With the HP 7475A, you also get automatic pen capping to prevent pens from drying out between uses, and special "pen damping" (gently lowering the pen to the paper or transparency) to increase pen life and ensure better line quality... use after use after use. You also get a rainbow of 10 colors to choose from, in two line widths.

Your choice: 2 paper sizes and today's most popular graphics software packages

While most professional business applications will be satisfied with standard 8½ x 11" paper or transparencies, the HP 7475A adds the



can be the key to your success.



capability of plotting on larger 11 x 17" media, too. The larger plots are especially well-suited for time lines, PERT charts, schematics and engineering drawings.

Best of all, you don't have to be a programmer to produce quality graphics on the HP 7475A. It's supported by a variety of professional graphics software packages for both HP and non-HP desktop and personal computers.

Naturally, speaking of software compatibility leads us to hardware compatibility....

Compatible with almost any personal computer in the marketplace today

With two interfaces available, the HP 7475A quickly "makes friends" with most models of today's most popular personal computers, including IBM[®], Apple[™], Compaq[™], Osborne[®] and Commodore[™] --as well as a host of HP computers.

The cost? Surprisingly affordable

The new HP 7475A Business Professional's Plotter is an amazingly affordable \$1895. When you consider that a typical fee for a single five-color transparency from a graphics service is \$50--and that the same transparency can be prepared for about \$1 in materials on the HP 7475A--the return on your investment is almost immediate.

Another choice: HP's low-cost, high performance Personal Computer Plotter

For the "business on a budget," you may also want a look at our 2-pen Personal Computer Plotter, the 7470A. Its low cost (only \$1095) is as remarkable as the quality of its plots. With many of the same features as the new HP 7475A, the HP 7470A plots on a single paper size (8½ x 11"). It stores and caps two pens,

and you can easily change the pens yourself for multi-color plotting. Best of all, the HP 7470A 2-pen plotter lets you turn your personal computer into a personal graphics workstation for only \$1095.

Send for your FREE "Better Presentations Package" today!

For a FREE sample plot, overhead transparency, and more details, mail the coupon below today. We'll also enclose a list of software packages you can use with the HP 7475A or HP 7470A.

For the name of your nearest Hewlett-Packard dealer call toll-free 800-FOR-HPHC.
1101303



**HEWLETT
PACKARD**

YES! I'm ready to gain a reputation for being more professional, persuasive, credible and effective than my competition. Please send me your FREE "Better Presentations Package," so I can learn more about the new HP 7475A Business Professional's Plotter and the HP 7470A Personal Computer Plotter. I understand I will receive this valuable package without cost or obligation.

Name _____ Title _____

Company _____

Address _____

City/State & Zip _____

Phone Number (_____) _____

My computer is _____

Send to: Hewlett-Packard

16399 W. Bernardo Drive, San Diego, CA 92127

Attn: Marketing Communications

11303 PMK

Other programs continue to flood the market, but WordStar remains the world's number-one word processor. Here are some reasons why, along with some news on MicroPro's splashy next release.

Why We Like WordStar

Two issues ago, technical editor Bill Machrone spoke of the setori attained after proper installation of an 8087 chip. Not to go holy on everyone, but for me, it's WordStar that is truly Zen-like. Why?

I contemplate an empty screen. My mind is devoid of all thought, which doesn't bode well considering the deadline for this article was last week. A small bell rings. It is not the clarion call of a distant Shinto temple. There is a subscriber on the phone who wants to know where he can get a DOS 2.0 tutorial on building a PC fish scaler. He swears he saw one written up in PC that interfaces with Lotus 1-2-3. When I convey my skepticism, he asks instead for instructions on running a Trident submarine via his RS-232.

I focus on the great distance between us and touch a key. A pattern of dots forms on the monitor. It is being refreshed 30 times

a second. I, on the other hand, am not being refreshed at all. I meditate on this for several hours, while wrestling with a lead sentence that sounds as if it had been scribbled by a hypoxic Sherpa after his first English lesson halfway up K2.

Then, in a clear and transcendent moment, a phrase flows effortlessly into my consciousness, down my arms, out my fingers, onto the keys, onto the screen, and then off again, out into the electronic trash can, the big bit bucket, in one long chain.

I'm not saying I do a lot of revision, but my function keys allow me to delete text in virtually every way possible—by the letter, by the word, by the line, left or right, up or down; with my amazing word processor I can now trash the entire piece in a mere second or two. This is much faster than the pre-electronic method of despairingly ripping a sheet of paper out of the

typewriter platen, crumpling it in a rage, and arching it over to the corner of the room where it will hit the side of a wastebasket and settle on the floor among its many cousins.

One Hand Typing

Perhaps my blood is hungry for sugar. With fluid movements I reach into a handy bag of cookies. The carbohydrates wrap themselves around me with a cloying buzz. A feeling of energetic stickiness throttles into my brainpan and I hammer out a solitary sentence. Then silence. Another cookie, another sentence. This is a blissful noise: fingers rustling in cardboard for a chocolate chip and the sound of one hand typing.

Soon, however, the mystical spell is broken, as the horripilating visage of the managing editor fills the doorway. When I



Our first date!



Surprise!
Valentine's Day!



A day at
the arcade.



A toast!



At
the beach.



128 seat
ROW ORCHESTRA \$40
Palace Theater
Sat. 8:00
**A
STAR IS
BORN**

Our favorite
restaurants!



Her birthday!



tell him I am reflecting on the koanlike, beatific qualities of word processors, he points out that unless I redouble my efforts, the issue is going to go to press with five blank pages bearing only the legend "from a friend," and that if the piece is not completed posthaste he is going to insert my yin and yang where the sun don't shine.

Once we've achieved this metaphysical understanding, the words fairly tumble out onto the screen. It's quite astounding what a little terror can do to kick the flywheel over. And when the sentences start cascading across the synapses, there's no better way, in my opinion, to pin the wriggly little devils down than with WordStar.

No, that's not a misprint. We'd be lost without WordStar. There are others out there; a recent tally listed 44 separate packages that billed themselves as word processors (including three that are multi-lingual for those who dream of heaving writer's block in more than one language), and another 18 as text editors. Not that

these other packages are bad, mind you. Some, like FinalWord, or MultiMate, could go a few rounds with the MicroPro Mareudat, but most of the others would take a dive at the opening bell.

Pork Plantation

The PC offices are a software junkie's dream come true; each day the Federal Express man staggers in the door shouldering a heavy Santa's sack of new releases. We stand around the pile distractedly opening the cartons while singing our own version of "What the World Needs Now" as yet another database, spreadsheet, Poc-Mon imitation, or word processing package tumbles out.

Now, we're the first to admit that WordStar has a quirk or two. It's not easy to master; you don't see ads showing a delighted user hammering away at the keys saying "15 minutes ago I had never touched a keyboard and now I'm doing column moves like a pro." Well, actually, you may. MicroPro's slick little brochure on the product boasts "even an inexperienced

typist can sit down with WordStar, learn a few basic commands, and then quickly turn out perfect mamos and letters. WordStar is that easy." Right. And pigs grow on trees.

Well, okay, maybe it isn't so simple. I remember some pretty confused moments when I had the manuals out in front of me for the first time. "You hold down what?? You have to hit this end this and this and this just to do that?" But now, after several months, my left pinky can diddle the Ctrl key like it was born resting on it. And between the cursor pad keys like Home and End and my customized WordStar version 3.3 function keys, I can virtually take fast dictation from my brain and get it down clean, first pass. Of course the nice thing about any word processor, and WordStar specifically, is that it's so easy to go back and fix and paste and change once you have something on a disk.

Sure, it would be nice if WordStar had a buffer so that if you accidentally deleted something you could resurrect it. And while we're at it, separate buffers for search-and-replace ("QA") and find ("QF"). And about 20 more function keys would come in awfully handy, each spitting out more keystrokes than the paltry six you get now. (See Janice Keefe's sidebar on the synergistic magic of WordStar and ProKey.) Onscreen italics and boldface would be a plus, as would spiffier reformatting of indented text.

But now you can run the thing in color. And it's memory-mapped so that it flies, compared to the older versions, especially when you're running on a RAM drive. And there are some truly wonderful touches. How many word processors can handle column moves, horizontal scrolling, hyphenation, and complex print-formatting options to beat the band? And fit handily in 64K? And include enough dazzling standard features to give dedicated word processors a run for their money?

Inscrutable Commands

WordStar's menus are simply the best anywhere. Of course, you have to know how word processors work—what they're capable of doing—and which cryptic WordStar commands perform which kinds of textual legerdemain. MicroPro tries. To mark a block of text, you slap a "KB" at the beginning of the block and a "KK" at the end. You should see what this double boldfacing looks like on the screen

31,268 flavors isn't just a dieter's nightmare.

If you want the world's best microcomputer database management system to handle the most complicated inventory control problems, here's the scoop:

dBASE II[®] the relational database management system (DBMS) from Ashton-Tate.

If you have a microcomputer and you'd like to put all your business information management problems on ice forever, you won't find a faster, better, more powerful solution than dBASE II. And it's just \$700 (suggested retail price).

For the name of your nearest dealer, drop us a line. Ashton-Tate, 10150 West Jefferson Boulevard, Culver City, CA 90230. (213) 204-5570.

ASHTON-TATE

© Ashton-Tate 1983
dBASE II is a registered trademark of Ashton-Tate

CIRCLE 153 ON READER SERVICE CARD



(and you can in Figure 1). As Corey Sandler points out, such lines cry out for a "OD" to erase the hodgepodge of carets and inscrutable embedded commands.

What's especially nice about these menus is that once you see how everything works end learn the many features offered, you can shrink the amount of space they take up on the screen. Some

WORDSTAR's menus are simply the best anywhere.

other word processors permanently waste almost a third of the screen with their prompts, status lines, warnings, borders, and geogaws. With WordStar you can reduce all this clutter to one unobtrusive line at the very top. (Version 3.3 offers a function key description on the 25th line, but contributing editor Steve Manes discovered a way to lop that off too. See "WordStar 3.24 And 3.3: MicroPro Does It Again ... And Again," PC, Volume 2 Number 1.) If you do need the menus while you're learning, you can park them onscreen in several different configurations.

It really doesn't take very long to learn the commands you'll want for everyday use. WordStar has dozens, but some, like column moves—while powerful and exceedingly nifty to use—just aren't called for very often. When you do need these exotic commands, you can pop the menu onto your screen and figure out which key to tap. Most of the users around the office, except the real old-timers, rely on the second level of menus. This way, the lists of choices normally don't appear on your screen, but will scroll down quickly when summoned.

If you really prowl through the documentation (which is tough for the vast number of users with bootleg copies; WordStar is not copy-protected) you can discover some of the less well-known commands that can make operation simpler. A good example is "R," which repeats the last name of a file you've entered. If you're editing and copying end renaming and printing and deleting, you can save

numerous steps by entering "R" at every name prompt after you've typed it in once.

Diamond Hard

Most of the office old-timers cut their WordStar teeth on C/P/M machines. You can spot these computer senior citizens instantly because they prefer the "diamond" of command letters adjacent to the Ctrl key, rather than such refinements as IBM's cursor-pad stroke-savers. They'll forego PgUp, Home, or Ins for the less efficient Ctrl+R, Ctrl+Q+E, or Ctrl+V—but this is just further proof of how ingrained and automatic WordStar gets.

It also means that once you learn the occurred C/P/M commands, you can use WordStar on just about every micro that's out there. I can walk over to some balky new water-powered boutique machine with a proprietary op system and unfathomable documentation, and if I can somehow get WordStar loaded, I can type happily away until the cows come home.

Since WordStar has to manage all nec-

essary file handling for all types of hardware, there are times when PC-DOS utilities are far speedier. Steve Manes and I both like to use WordStar on a RAM disk. Try slogging through a 60 Kbyte file on a floppy; the wait seems eternal. On a disk emulator it's lightning quick. Steve created a simple batch file to use rapid DOS copy routines rather than WordStar's chuggier ones. He saves and exits (using "KX") and then uses miracle DOS batch files with replaceable parameters to create the copy and then reload WordStar and the proper file at the same time. (You can do this by appending the filename when you invoke the program.) His batch file is shown in Figure 2; to use it, simply enter the program, name it "W.BAT", then type in: W FILENAME (substitute your own filename). Tip: You can create batch files using WordStar rather than with the DOS COPY CON: command. If you have enough memory, you can load WordStar on one RAM drive and keep your files on another. (If you do this however, you'll have to change the batch file slightly.)

LAKE AVENUE SOFTWARE

INTRODUCES



© 1983 Art Chisley

Flexible Accounting Software

Written entirely in dBase II by CPA's. Source Code Available.

List: \$475 per module. Introductory offer: General Ledger — \$375

Available for IBM PC, MS-DOS and CP/M Systems

General Ledger Financial Reporting Accounts Receivable Accounts Payable Payroll Professional Time & Invoicing Job Costing

The Assistant Controller™ Series

Lake Avenue Software • 77 North Oak Knoll, Suite 105 • Pasadena, CA 91101 • (213) 792-1844

CIRCLE 251 ON READER SERVICE CARD

Rumpelstiltskin Phone Home

And because it runs on so many machines, it's become the unquestioned standard. Writers who send us WordStar files are doing us a big favor; we can noodle around with the prose if we need to, without any trouble, then pop off hard copy in minutes. We tear our hair out, however, when someone foists a foreign disk on us with the absurd caution, "It's a semi-DOS file." Who could invent such a thing, and why? This means untold anguish deciphering what's on the floppy while guessing how to get it to talk to our text editors and printers. Fortunately, WordStar's "search-and-replace" feature is so good that it can spin such straw into gold.

The search-and-replace utility also comes in handy when you're writing or debugging programs. Sure, there are special program editors around that have one or two better features, but if you want one text processor for all your needs, you just can't get your hands on anything else that will measure up. And its related "find"

utility is perfect for jumping to a certain place in your text, or checking on how recently you've used a certain word, or seeing what you said about a subject earlier in the document. What makes this especially handy is that you can easily mark where you were before you started your search, then jump right back with two keystrokes after you've found it. These two features also make child's play out of going back afterwards for editorial corrections and additions.

Here's a nifty search-and-replace trick that's been around for years: If you have to type a book title or a firm name or a long serial number several times in one file, you could just abbreviate and go back later and search/replace the real thing; everyone knows that. But you'll probably have to reformat the entire document, since such repeated substitutions invariably unbalance the right-hand margin. And let's face it, if you have anything other than vanilla margins, WordStar can be downright awful when it justifies.

Instead, use the search and replace fea-

ture as you write. Type in "QA," and when it asks what you want to find, just hit the Enter key without typing anything else in. When it then asks what you want to replace it with, type in the long repetitive phrase or number and hit Enter. You're

WORDSTAR's
search-and-replace
feature is so good that it
can spin such straw into
gold.

essentially telling it to replace nothing with a hard-to-type something. As soon as you hit the second Enter, hit N since it will ask if you want to do a replace right away. Then each time you want to type the long phrase, just type "LY" instead, and voila—it flashes onto the line in the proper place. I'm doing this myself with the word WordStar—a tough word on the fingers with its front and back italics markers and its central capital letter.

Best Patch Around

WordStar does have one dreadful flaw. The command to kill a word to the right of the cursor is "T." But the command to wipe out the entire line is "Y." You may have noticed that these keys are right next to each other. And since WordStar does not have a huffer that can unerase something you've just deleted, you can excise an entire line when you're just trying to ruh out a short word or even a single mistyped character.

There is a solution, however, and we don't know how we ever got along without it. For a mere \$50, you can get your hands on the WordStar customization notes (MicroPro slashed the price from an absurd \$500 a year ago). While this tome will never replace Flaubert or Perelman, it does make fascinating reading. The only problem with it is that it's not IBM-specific enough. But with it, you can switch keys around, create your own menus, drive oddball printers, and toggle all sorts of interesting features on and off. A careful reading told us that all commands have the potential to be two keystrokes long. So



MicroMate

MicroMate Table # TA-10 & Chair # 323 pictured here with IBM PC.

Completely Adjustable Computer Table and Chair with finger tip pneumatic power controls to suit any operator.

67% re-order rate by largest corporations.

IN STOCK for immediate shipment.

Call or write for more information

MicroMate Inc.

73 Hickok Rd., New Canaan CT 06840

(203) 966-1571

CIRCLE 413 ON READER SERVICE CARD

PCnet™ and the IBM-XT

Your Total Solution for IBM PC Local Area Networks.



Share Your IBM-XT Hard Disk or other Hard Disk (*) PCnet Major Features

• Local Area Network and Shared Resource Management

- Broadcast Coaxial Bus Network
- Network errors handled similar to DOS
- PC to PC communication

• Remote PC Execution

- Background program execution at Shared PC
- Multi-tasking use of Printers, Modems, etc...

• Computer Vendor Independence

- IBM PC, IBM PC-XT
- Compaq
- Columbia
- Corona

• IBM MS-DOS Transparency

- MS-DOS 1.1, 2.0
- Off the Shelf program execution over network
- File Transfers use MS-DOS commands

• Hard Disk Vendor Independence

- IBM
- Tallgrass
- Microcode
- QCS
- Datamac
- and many other well known Hard Disk Drives

• Disk and File Sharing

- Public and Private Files/Volumes and Disk
- File/Record Locking and Unlocking
- No Dedicated File Server; PC can act as File Server
- Multiple File Servers

Future Features

- Networking SNA, ETHERNET, X.25
- Value Added Applications
- Electronic Mail

Electronic Mail
NOW
AVAILABLE

• Performance

- Serial coaxial bus at 1 megabit/sec up to 7000 feet
- No significant User PC degradation

See us at
COMDEX
Fall '83

November 28-December 2, 1983
Las Vegas Convention Center
Booth # 1601

• Ease Of Use

- Single PC slot for PCnet adapter card
- Standard coax and BNC connectors
- Automatic Load using AUTOEXEC.BAT



ORCHID
TECHNOLOGY

47790 Westinghouse Drive,
Fremont, California 94539 • (415) 490-8586
Telex-171596

IBM is a registered trademark of International Business Machines Corp
MS DOS is a registered trademark of Microsoft Corp
PCnet is a trademark of Orchid Technology

Copyright 1982 Orchid Technology

Specifications subject to change without prior notice
Identical models available in Europe, Australia, Japan, Canada

CIRCLE 411 ON READER SERVICE CARD



When ordering, please specify both the computer operating system and the hard disk version. Orchid supports many different combinations and is adding new configurations each day.
Send for our literature and a demo diskette. Write to: Orchid Technology, 47790 Westinghouse Drive, Fremont, CA 94539.

we looked up the memory address of "Y and changed one little byte so that you now have to hit it twice before you do any damage. Hit it once by mistake and you can squirm out just by typing the spacebar. (See Figure 3 for detailed instructions.)

That's another thing we admire: WordStar is generally very forgiving. Screw up with some other word processors and you're dead. But with WordStar, you can usually just hit "U"—short for "uh oh"—then Esc and you're safe. If you fry a file to a fare-thee-well, you can quit it gracefully and start over. Under the worst circumstances, there is always the automatic backup file WordStar created when you dove into the original to butcher it up.

The program tries hard not to let you screw up in the first place. Type an inappropriate command and WordStar is likely to ignore it. For instance, when you first boot WSCOM, there are only several letters you can enter that will actually do anything. Hit one that's not on the menu and WordStar will just sit there twiddling its thumbs. Or if you hit some crazy command like "C" while editing, you'll get the same unresponsive answer. Some other word processors will take the big flush when you try something untoward like that.

Finally, when you do make a big mistake, it's invariably simple to fix it with block moves in and out of previous versions and temporary files. The exception is the dreaded "disk full" catastrophe, but even this has become no big deal, since there are now several ways to crawl away with at least most of your work intact. Saving to disk often, dividing your files up into small, workable sections, and using disks that aren't cluttered with garbage are all good ideas that will head this off at the pass. But if you do end up with a full disk and an unsewed file, you can either delete old files from the disk while still in WordStar, or use the clever trick described by Randy Bennett and Roger Kershaw (See "Fast Recovery From WordStar Disaster," PC, Volume 2 Number 1.)

Fingers Never Leave My Hand

According to John Schnell, general WordStar expert and PC contributor: "One reason I use it is that it was the word processor I learned first. I've tried a few others, but I keep coming back to WordStar. One of the reasons is that what you

see on the screen is what you get when you print it out. Having everything run under the control commands is also important—your hands never have to leave the home row. Word processors on other machines are very indirect—you have to step through a number of menus or drop down a level from the document you're working

on to give instructions to the program.

"I'm so far beyond it that by now WordStar is totally automatic and internalized. It's hard to learn but easy to use. You find that out when you try to teach other people how to use it. One thing that really surprised me after I used it for a while is that all the information—the commands

If buying a car was like buying software, you'd see a lot of these on the road.

A flashy vehicle. No doubt the result of several great ideas. But hard to drive with the performance you expect.

Until now, buying business software was similar, a lesson in irregular mechanics. Sure, you can put together all of your own pieces, but will the resulting vehicle give you the performance you expect? If you need consistent operation, easy response, smooth on the straights yet tight on tough corners, we have the answer.

Executec software: the secret's in the system.

One completely integrated software system provides decision support and office automation in a uniform, consistent environment. Software that gives you the power to challenge the total range of business problems by using one synergistic structure.

SeriesOnePlus: simplicity plus power.

We call it SeriesOnePlus. You'll call it incredible. Start with the programs you need most—word processing, spread sheet analysis, data management, and the Execu/BUS* master program. Assemble any of the eight additional programs available** for even more problem-solving capability. Now you can easily command the resources you constantly need at your fingertips.

*Patent Pending

**Additional programs available: Execu/REPORTER™—report writer, Execu/PLOT™—graphic analysis, Execu/LINK™—3780 communications for the IBM® PC, PromptDoc™—user documentation program; plus Fixed Asset Accounting and three other financial industry products.

SeriesOnePlus is available on the IBM® PC, Porto® Series 16, Durango Poppy®, DEC Rainbow®, Wang® PC, Victor® 9000, and many other 16-bit MS-DOS computers.

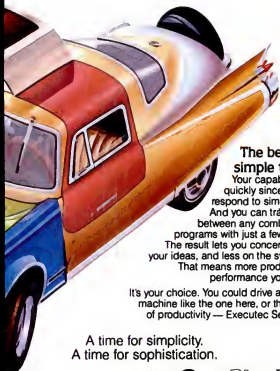


and classifications of commands—are in the menus. They're really well thought out, but you don't appreciate this until after you've learned how to use them. And, it is a more than adequate editor for writing and debugging programs."

From Steve Manes: "The single best feature of WordStar is that you can per-

form every function it has to offer without ever breaking your concentration by leaving your text. It also seems to have anticipated all the important aids that weren't available when it was developed—keyboard enhancers, hard disks, RAM disks and the like. Now if only it would do windows."

© 1983 Executec Corporation



The benefits are simple to achieve.

Your capability develops quickly since all programs respond to similar commands.

And you can transfer data between any combination of programs with just a few keystrokes.

The result lets you concentrate more on your ideas, and less on the system details.

That means more productivity, the performance you expect.

It's your choice. You could drive an impractical machine like the one here, or the new model of productivity — Executec SeriesOnePlus.

A time for simplicity.
A time for sophistication.

seriesOnePlus™

Software that stands the test of time.

Contact your dealer
or Executec today.

Executec Corporation
12200 Park Central Drive
Durango, Texas 75251
(214) 239-8080

IBM, Pearly, Poppy, DEC Rainbow, Wang, and Vector are registered trademarks of International Business Machines Corporation, Pearly Computers, Inc., Durango Systems, Inc., Digital Equipment Corporation, Wang Laboratories, Inc., and Vector Technologies, Inc., respectively.

CIRCLE 210 ON READER SERVICE CARD

Technical editor Bill Machrone adds: "I like WordStar because I've known it cold since CP/M version 0.92A. I've tried others but they either didn't have the sheer number of features or weren't really as easy to use once I learned them. For instance, there are many multimode word processors out there that are a pain in the neck, since it seems you're never in the mode you want to be in. In WordStar you're in command mode and text mode all the time—there's no distinction.

WHAT

*you see on the screen is
what you get when you
print it out.*

"MicroPro has continually upgraded and improved the product, and was first on the market with a lot of important features, including some blockbusters that a lot of packages still don't offer, such as column moves. I've taught a lot of people how to use WordStar and have found that most people think the basics are fairly simple to learn. This is probably because I always ask myself when instructing a new user: 'Which 40 percent of WordStar do I have to teach this particular person?'

Undocumented Features

"It's exceedingly flexible, and there are a number of undocumented features. I use proportional spacing to give an occasional business letter a professional appearance. There's a switch inside the software that changes the microjustification algorithm; I use that just to make my documents look different. I've petched WordStar for color terminals and 60-line terminals, used various sets of function keys, and have used it to drive everything from relatively featureless teletypes to Spinwriters. It handles all of the arcane print enhancements and handshaking specs with ease.

"MailMerge is not the single most powerful extended formatter on the market. Spellbinder and even Peachtext have logical or looping capability that is absent in MailMerge. But MailMerge is easy to understand and use, and it gets the job done. Where people don't use it and should

is in doing really simple things, like printing multiple copies of a document, or automatically inserting the date into all your correspondence, or queueing chapters of a book. And it also has a host of dot commands that either override or expand

Star are an ideal mix. Any version of WordStar earlier than 3.3 doesn't make it easy to customize your function keys, but there are programs around that will do this for you (John Schnell wrote a particularly good one for the premier edition of PC Disk Magazine.)

Future WordStar Enhancements

We recently spoke with MicroPro's WordStar product manager, Ken Walsh, about the product's future. Walsh confirmed that new releases would be written in C rather than 8086 assembler as is done now, and discussed some of the features we might be seeing in future editions. Like everyone else in the intensely competitive micro biz, he punctuated every sentence with the standard disavowals, caveats, gainsays, disclaimers, and traversals. So, for the record, the following enhancements are simply features the company is researching. Hmmm...

The number-one problem reported by most users, Walsh claims, is that WordStar is hard to learn. In response, we

should expect to see several instructional aids in the not-too-distant future. New end users may soon be trying out their control codes on a floppy interactive tutorial. Businessmen, on the other hand, will learn from new MicroPro "multiple tools" packaged to teach entire classes at one sitting, perhaps with laser disks. Walsh says he'll have cold-start first-timers banging out memos and short letters in the first hour of instruction.

The specific enhancements are enough to make any WordStar user's mouth water, but Walsh cautions that they won't be immediately available. Heading the list is true proportional spacing, which the program can actually do fairly decently in its present incarnation if you know the secret code. Not far behind is paragraph reformatting that will retain indentations and eventually be done automatically so that you don't have to go back and type "B—or even 'Q'Q'B—each time.

MicroPro engineers are also restructuring the system of mnemonics to group commands in more logical families and

THE number-one problem reported by most users is that WordStar is hard to learn.

the normal print formatting of WordStar."

Okay, we all agree it's not perfect. And you do need to exploit your function keys if you want to crank out any real speed. The arrangement we use around the office is shown in Figure 4. ProKey and Word-

the
wood
works

solves your workspace and storage problems elegantly and economically with natural wood workstations, printer tables, and accessory units.

Below: 46" natural oak worktable with 44" regular shelf unit — \$185.00
natural oak printer table — \$150.

Beginning at \$175.00

We manufacture and sell direct to end users. Enjoy the beauty and function of hardwood and hard wood veneer furniture at prices comparable to plastic laminate and metal. We guarantee that you will be pleased with our handcrafted items. We believe that there is no finer wood furniture available in this price range. Choose from oak, walnut & cherry, natural or stained.

For information or to order, call or write.

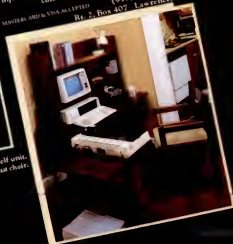
the
WOOD
WORKS
(913) 842-7797

RE. 2, Box 407 Lawrence, KS 66044

HANDMADE AND VENEER ACCEPTED



Right: 46" stained walnut worktable with adjustable shelf unit, drop leaf and drawer. Also shown, printer table & walnut chair.



Effortless Communication



PC Modem Plus & IBM Personal Computer

Effortless Communication The PC Modem Plus™ is all you need to link your personal computer to the world. Everything is included: internal modem, software, telephone cable and instructions. The modem card fits right inside the PC and connects it to the phone line. No more messy clutter in the work area. The software makes communications a snap—a single key-stroke connects you to any computer, anywhere.

The Best Modem The PC Modem Plus™ System provides features and flexibility no one else offers. Like an additional serial port for your printer and an extra telephone connector which lets you switch between voice and data. The PC Modem Plus™ even connects to your PC's speaker so you can hear the call being made.

The modem is available in both 1200/300 and 300 baud speeds. You can even upgrade the 300 baud version—it's as simple as adding the PC Modem Speed Adapter™. And at both speeds, the PC Modem Plus™ provides full duplex operation, auto-answer/auto-dial, and tone or pulse dial.

The Best Software The PC Modem Plus™ System comes complete with CROSSTALK-XVI™. This powerful communications software makes it easy for you to automatically dial a number, store data directly onto disk, or exchange files with minis, mainframes or other microcomputers.

Ven-Tel Inc. 2342 Walsh Avenue, Santa Clara, CA 95051
(800) 538-5121 • (408) 727-5721

PC Modem Plus and PC Modem Speed Adapter are trademarks of Ven-Tel Inc. IBM is a registered trademark of International Business Machines Corporation. Crosstalk is a trademark of Microsoft, Inc.

Announcing A Major New Innovation From The Publishers Of [JH]

Now, Get Up To 72 Programs For As Little As \$2.00 Each.

Introducing PC DISK MAGAZINE. The Only Magazine On Disk That Gives You A Library Of Software Programs For Your IBM Personal Computer ... At A Fraction Of The Price!

Imagine building a library of software programs with amazing ease...adding utilities, subroutines, games and data files to your system...for as little as \$2 per program! Introducing PC DISK MAGAZINE—a totally new concept for your microcomputer that gives you all this and more! You get thoroughly tested, ready-to-run programs on a floppy disk—complete with a comprehensive, illustrated User Manual—for the ultimate in ease, efficiency and economy. With your subscription to PC DISK MAGAZINE you'll receive a floppy disk containing up to 12 varied ready-to-use programs and files. Developed by experts and tested by the editors, you'll be able to expand the use of your IBM personal computer.

Business and Finance Aids: Create advanced pie, bar and line chart graphics. Compute loan payment tables. Calculate the Present Value and Internal Rate of Return for your investments. VisiCalc™ templates for

Real Estate, Lease/Purchase and Tax Shelter analysis.

Programming Tools: Create cross-reference listings for your BASIC programs. Convert MBASIC™ program files to CBASIC™ format or reverse. Use your text editor on your BASIC programs. Convert data between BASIC and VISICALC® or Supercalc® formats.

Home/Personal Applications: Whether you need your own income tax return helper...proven ways to maintain a mailing list...a personal cash flow analyzer...a speed reading trainer...or SAT test preparation aids, you'll get it from PC DISK MAGAZINE.

Utilities and Diagnostics: Print graphics, screen images on your printer...backup, copy, delete, un-delete or type files with simple menu commands. Use your computer to simulate a conversational terminal with function key control of disk or printer logging...and more.

Data Files: Tax tables, population statistics, dictionaries and economic times series.

Games: Adventures! Strategies! Test your skills, intelligence and your luck!

Everything Is Ready For You

PC DISK MAGAZINE has everything you need. The accompanying 60-page User Manual is written clearly, concisely, in easy-to-understand terms. You'll be able to try the programs immediately...there's no need to type listings into your computer. Just insert the disk and go! That simply, all the latest software developments are at your fingertips!



A LIBRARY OF SOFTWARE PROGRAMS FOR THE IBM PERSONAL COMPUTER

PC DISK MAGAZINE

BUSINESS & FINANCE
LOAN ANALYZER
AUTOMATIC BARTER
WORDSTAR CONFIGURATOR

PROGRAMMING TOOLS
BASIC PROGRAM EDITOR
PERFECT 101 ALPHABET

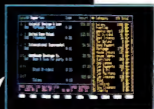
HOME PERSONAL
PERSONAL CASHFLOW MANAGER
PARTY QUE

© 1984 Ziff-Davis Publishing Company. All rights reserved. IBM and IBM logo are trademarks of International Business Machines Corporation.

UTILITIES & DIAGNOSTICS
DISK MAP
BENCHMARK PRINTER
CONTROL

DATA FILES
DEMOGRAPHIC DATA FILE

GALES
HOL AND SPA
PYRAMID WAT-11



SEARCH AND SORT RESULTS

File: Size: Date: Sort: Search:

Start: Stop: Search: Sort:

File: Size: Date: Sort: Search:

File: Size: Date: Sort: Search:

File: Size: Date: Sort: Search:



PRODUCT SPECIFICATIONS

- Programs will run on IBM PCs and compatible computers running versions 1.1 and 1.2 of MS-DOS.
- Most programs will be written for monochrome and color displays; however, some games and utilities may be developed for color display.
- Most programs will be written in advanced BASIC; however, some machine language and compiled code may be used.
- Programs and documentation are copyrighted by Ziff-Davis Publishing Company. All rights of reproduction in all forms and media strictly reserved.

PROGRAM SUBMISSIONS

If you wish to submit a program for inclusion in future issues, please write to: PC DISK MAGAZINE, Attn: Editor, One Park Avenue—Dept. 732, New York, N.Y. 10016.

GUARANTEE

- All programs are fully tested and guaranteed to run. Damaged or faulty disks will be replaced at no charge.
- If you wish to cancel a subscription, simply return the most recent disk in its sealed package and you will receive a full refund for this copy and on all unmailed issues.

Save \$60 With This Introductory Savings Offer. Get 6 Big Issues of PC DISK MAGAZINE And Save 34%.

PC DISK

P.O. Box 2462, Boulder, CO 80322

84120

YES, Please accept my subscription to PC DISK MAGAZINE for 6 issues at the Special Introductory Price of just \$119 (less than \$20 per issue, as little as \$2 per program). I save \$60—34% off the full price of \$179.

- Check one: ☐ Please bill me. ☐ Payment enclosed.
☐ Please charge to my credit card.
☐ American Express ☐ Visa
☐ MasterCard

Credit Card No. _____ Exp. Date _____

Name _____

Address _____

City _____

State _____ Zip _____

MAIL NO-RISK COUPON TODAY — AND SAVE 34%!

OPTIMIZING C86™

is now (8/15/83) in Beta Test.

Call us to see if it is available now.

Any customers who purchase the current product will be able to upgrade to Optimizing C86 without charge.

It includes the following improvements from C86 1.33:

- Substantially faster execution speed of the programs you write. We've seen some programs run 300% faster. Overall speed has been improved along with I/O and string handling.
- 1,000K Addressing of code and data is supported as a compile-time option - "Large Model"

When released commercially it will also have:

- Object module format compatible with your OS and Assembler
- 8087 code inline (faster execution)
- Option for Assembler output from the compiler
- Extra functions for MSDOS 2.0
- New manual has examples for every library function

Other Notes:

- ISAM products and products compatible with C86 and with OPTIMIZING C86 are available from some of our customers. Graphics and screen manipulation function libraries are available. Ask for a product list.
- C_to_dBASE™ is in Beta Test by CI. It is a package to interface C86 with dBASE files. Heavily annotated source to the product and a function library are included. Save time and learn C86 quickly.
- A C86 User's Group is being formed.



C86™ - For Professional Programmers OFFERS "C" FOR PC-DOS, CPM-86, MS-DOS, MPM-86:

- FULL IMPLEMENTATION of C—Syntax and Library
- NO ROYALTIES—include routines from our Library in your commercial software without paying us royalties.
- LIBRARY SOURCE makes customization easy for you
- LIBRARY EXTRAS include math, trig, much more
- FAST CODE—the January Byte benchmark showed C86 to be fast, 8087 support is included.
- OVERLAY SUPPORT helps with large programs
- A LIBRARIAN supports object and source modules
- ROMABLE programs may be written.
- ASSEMBLER may be included to write a function.
- HOTLINE SUPPORT brings competent and prompt help.

See your local Dealer or Call Computer Innovations to:

- ☐ Buy C86 for \$395
- ☐ Get Details

All formats available:

- PC: Random, Vector, Z80, etc.
- VISA and MasterCard accepted

C86 is a trademark of Computer Innovations. CPM-86 and MPM-86 are registered trademarks of Digital Research. MS-DOS is a trademark of Microsoft. PC-DOS is a trademark of International Business Machines.

Price subject to change without notice



Computer Innovations, Inc.
10 Mechanics St.
Suite J-155
Rutherford, NJ 07070
Phone: (201) 536-0865

OPTIMIZING C86 and C-to-dBASE are trademarks of Computer Innovations. dBASE is a trademark of Ashton-Tate.

make them easier to remember. Walsh admits they are "a little fragmented under the present system." Whether this means we'll have to relearn codes is not clear. Future versions of WordStar will have math capabilities to perform calculations on tables of figures, and perhaps more.

New printers are flooding the market, and WordStar is rapidly being configured to handle them. And there may be more sensational features. Windows are being given serious consideration, according to Walsh, although as he points out, since WordStar now runs under Concurrent CP/M, you can switch adroitly back and forth

Sandler's Secret Ingredient Word Processor

Executive Editor
Corey Sandler
redefines WordStar.

Executive editor Corey Sandler, who paces a lot when he's searching for the muse, sometimes stops strangers in the hallway to sing "Ode to OD" or a "Paean to ProKey."

"To begin with," he'll tell you, "I don't use MicroPro's WordStar at all. It's a real pain. What I use is Sandler's Secret Ingredient Word Processor. MicroPro is merely a supplier for me, an OEM, if you will."

What's inside his word processing stew? WordStar 3.3, without the status line at the bottom (removed with Steve Manes' Debug change. See "WordStar 3.24 And 3.3: MicroPro Does It Again... And Again," PC, Volume 2 Number 1); with Paul Somerson's magic Control Y antidestruction device; and with a full set of ProKey modifications to every function key and a few regular character changes as well.

"The very first thing I did with ProKey was to trash WordStar's illogical assignment of the delete key on the PC. I want the delete key to take out the character immediately above the cursor. So I redefined the delete key as Control G.

"Then I redid all of the function keys. Every one of them has a new assignment—

CIRCLE 181 ON READER SERVICE CARD

Arrange your PC any way you like.

The 3' Monochrome Display extension cable set and 3' or 9' coiled Keyboard extension cable by Curtis give you the flexibility to arrange your IBM PC just the way you want it—comfortably.

Don't be tied down or limited by movement range. Increased mobility reduces tension and makes you feel better at the end of the day.

Curtis offers fully shielded extension cables and the highest quality connectors available for your PC.



Now, when you purchase the EC-I or EC-II, you get a FREE snap-fit keyboard dustcover for your IBM PC. It's flexible, durable and **FREE**.

Re-arrange your IBM PC ... comfortably

Developed exclusively for the IBM PC, all Curtis products have a lifetime warranty and are a perfect PC match in color, style and finish.

PC pedestal™ II, Tilt and Swivel Base (for IBM PC Monochrome and Color Displays)	79.95	EC-I 3' Extension Cable Set (for IBM PC Monochrome Display)	49.95
AD-I Adapter for PC pedestal™ (for Princeton Graphics Systems and Quadchrome Displays)	9.95	EC-II 3' to 9' Extension Cable (for IBM PC Keyboard)	39.95
SS-I System Stand (for IBM PC System Unit)	24.95		

Manufacturing Company, Inc.

CURTIS

Curtis Manufacturing Company, Inc.
Peterborough, NH 03458

Available at all
ComputerLand Stores
or your local PC dealer.
Over 800 locations nationally.

For the dealer nearest you
call (603) 924-7803.

A102



Computer Workstations by New England Wood Designs, Dublin, New Hampshire 03444
Copyright Curtis Manufacturing Co., Inc.

between it and a database. But how many PC users are going to switch to CP/M? How many fingers am I holding up?

The new WordStars will probably support page-by-page footnoting, widow and orphan protection, expanded function key use, and multi-line headers and footers. And rather than the current welter of embedded commands, future releases will likely have a better system of displaying such print enhancements as underlining and boldfacing. You may instead see such highlighted sections in reverse video or high-intensity text onscreen. And you'll be able to jump to specific pages, some-

you can read about them in my review of ProKey (See "Doing It Your Way With ProKey," PC, Volume 1 Number 9). My favorites, though, are:

- F1: Set line spacing to double, turn off hyphenation, turn off justification, remove the ruler line at the top of the screen, and dispense with all of the help screens (Control OS2; Control OH; Control OB; Control OJ; Control OT, and Control OH1).
- F2: Save and Return (Control KS).
- Alt F2: Save and go to menu (Control KD).
- Ctrl F2: Save, go to menu, enter print menu, call up name of last file, skip over irrelevant queries, and begin printing. (Control KD; P; Control R, and Escape.)
- F3: Underscore (Control PS).
- Alt F3: Begin underscore, accept copy until carriage return, then complete underscore.
- F4: Super boldface (Control PD, Control PB).
- Alt F4: Like Alt F3, an automatic open and close boldface command.
- F5: Reformat a paragraph (Control B).
- Alt F5: Reformat everything from below the cursor to the end of the page, and then return to this point for further instructions (Control QPB1, Control QP).

There are more tricks in Sandler's bag—enough so that no one else on the staff is fully able to use his adapted WordStar. They include things like automatic header set-ups, pre-set letter formats, and secret words and passages that only he can understand. (That's one way he manages

Personal Systems Publications

How to repair and maintain your own IBM PC/XT



Simple, step-by-step instructions that save you money and increase your computer productivity.

IBM is a registered trademark of the International Business Machines Corporation

ONLY

\$19⁹⁵

Introducing the unique 200-page manual that lets you troubleshoot, repair and maintain your IBM PC and XT at your own proficiency level. Using it, even if you have no knowledge of electronics, you'll be able to troubleshoot, repair and replace subassemblies.

If you have some electronic knowhow, you'll be able to repair right down to the component level, using no other test equipment than a common volt-ohmmeter and logic probe. *The more you know about the IBM PC or XT the more you'll profit by this manual.*

In clear, easy to follow chapters you'll learn how to:

Reduce Downtime and dramatically increase your personal computer productivity.

Save Money on Repair Calls — you'll be amazed at how much repair you can actually do by yourself!

Order now at low \$19.95 introductory price!

This special prepublication price — *for mail-order only* — will be in effect only until the manual appears in computer stores. So act now — and save!

Send money order or check for \$19.95 payable to Personal Systems Publications. (Price includes all taxes, postage and handling.) Act today!

● **Personal Systems Publications**

P.O. Box 90754
Los Angeles, CA 90009

CIRCLE 507 ON READER SERVICE CARD

thing you can't do now.

You should soon be able to delete to the following punctuation mark, as well as deleting forwards and backwards to the beginning and end of a paragraph. The onscreen prompts almost certainly will be expanded and enhanced. And way down on the list is keyboard-controlled onscreen graphics. Not all of these enhancements may make it onto the disk right away, and the next release is not expected in the immediate future. But it won't be in the year 2000 either.

Walsh hinted that future editions may be released with different levels of com-

to keep stragglers from sneaking in and using his machine when he is out packing.)

"One other thing I do is to leave ProKey available to me for short-term macro programming while I'm writing," Sandler said. "For example, just for this article I assigned Alt W to become a temporary special key to save typing: It types out an underscored WordStar with one combined keystroke. When I exit the program, that assignment is gone. Next time Alt W might stand for the Polish version of VisiCalc. What more could a guy want?"

Sandler answered his own question a minute later as he began humming a few bars to the "Ode to OD" (lyrics to the tune of "Ruby"). One of WordStar's virtues is the fact that it lets you know that you have called for boldface by showing a "B" on the screen; for double printing, by leaving a "D"; for underscore, by displaying "S"; and a few other special characters. One of its most annoying quirks is that the Ss, Ds, Bs, and other characters can run into copy, making it at best, difficult to read. The other problem comes if you are trying to line up copy for a table or for special indents in your copy. It is not easy to find the correct position for characters with all of those control marks floating around.

"Enter Control OD and your problems are at an end," Sandler rhapsodizes. "The garbage disappears, your columns line up, and all is well with the universe. Unless, of course, you forget to put in a closing underscore, boldface, or double print mark, in which case your printer will have a different kind of 'O-D.'"

—Janice Keeffe

Increase productivity, create a system that's comfortable.

plexity. After all, most people don't begin to tap even half the power of the present package. A financial expert who needs to add columns of numbers and a secretary who types standard business letters and a footnote-heavy scholarly author all have different needs.

IBM On The Bandwagon

MicroPro has sold "600,000 straight packages," according to spokeswoman Jan McGowan, making it the best-selling word processor in micro history. She adds that the single best-selling format in recent years has been for PC-compatible hardware. IBM is even selling it now.

Walsh says the figure is actually approaching one million, worldwide. WordStor is distributed in ten languages in 28 countries, and runs on 60 or more different machines. And MicroPro is not stinting its efforts in other areas—they're crowing about their new 20,000-word Houghton-Mifflin American Heritage spelling checker, as well as about StorIndex, the can-do utility that creates tables of contents with up to four levels of sub-entries, creates alphabetized indexes, creates lists of figures and tables, indexes across different files, inserts blank pages where necessary, tracks page numbers through additions and deletions, chops, greets, slices, and dices.

MicroPro still doesn't want to get involved with end-user complaints, and they charge a bundle for updates (currently a whopping \$85 each for WordStor, MailMerge, and SpellStor 3.3) but they seem to be making an effort to keep users happy. The ghastly, incomprehensible manuals of the past have been replaced by attractive, better-organized, illustrated, halfway breezy ones that fit neatly on your desk in IBM-sized slipcases. The new installation program takes a while to huff and puff your way through, but is awfully chummy, often asking you to verify a change three or four times. And they even give you little gaily colored keytop stickers in addition to the old reference card.

Look, I admit there is room for improvement. I would like to be able to plug a database or another file into a window and move text down into my document with the touch of a key. The high-bit characters at the end of each word are an occasional problem, but the world out there is accustomed to them and in most

Curtis IBM PC improvements and modifications are designed to help you configure a system that's comfortable and more productive. You'll discover that Curtis products help you work longer and better. Visit your local IBM PC



dealer for a first hand feel on how to get more comfortable with your PC.

Re-arrange your IBM PC ... comfortably

Developed exclusively for the IBM PC, all Curtis products have a lifetime warranty and are a perfect PC match in color, style and finish.

PC Pedestal™ II, Tilt and Swivel Base (for IBM PC Monochrome and Color Displays)	79.95	EC-1 3' Extension Cable Set (for IBM PC Monochrome Display)	49.95
AD-1 Adapter for PC Pedestal™ (for Princeton Graphics Systems and Quadchrome Displays)	9.95	EC-2 3' to 9' Extension Cable (for IBM PC Keyboard)	39.95
SS-1 System Stand (for IBM PC System Unit)	24.95		

Available at all
ComputerLand Stores
Entre Computer Centers
ComputerMarts
ComputerCrafts
Micro Age
or your local
PC dealer.
Over 800 locations nationally.

For the dealer nearest you
call (603) 924-7803.

A105



Computer Workstations by New England Wood Designs, Duxbury, New Hampshire 02444

Manufacturing Company, Inc.

CURTIS

Curtis Manufacturing Company, Inc.
Peterborough, NH 03458

get comfortable

Copyright © Curtis Manufacturing Co., Inc.

XyWrite II

Word processing when there's no time to waste.

When you have a pressing need to get your thoughts on paper, you don't want word processing software that distracts you with a crazy command system. XyWrite II is logical. It's easy to learn and stays with you in your most troubled times.

For your demo disk, just send \$7 to XyQuest, P.O. Box 372, Bedford, MA 01730. Money back if you decide to buy. XyWrite II is only \$195, direct from XyQuest.

Split screen • Simultaneous multiple file access • Horizontal scroll • Column moves • What-you-see-is-what-you-print • Indexing • Unlimited footnotes, end-notes • Headers/footers • Boilerplating • Foreign language characters • Background printing • On-line "help" • Executes DOS commands directly from program • Extensive printer support • Reference and tutorials • and more.

"NORTH OF KATMANDU - Six hundred years after the rampages of Ghensis Khan, savage Mongolian tribesmen still roam freely in these wild and rugged mountains."

XyWrite II is designed for the IBM PC and compatibles.

MasterCard VISA

XYQUEST

(617) 275-4439

Figure 1: Thicket of unsightly control characters needed just to double-strike and boldface four single letters in a sentence.

To mark a block of text, you slap a "K'D'B'D'B" at the beginning of the "D'Bb'D'bloC'D'Bk'D'B" and a "K'D'BK'D'B" at the end.

Figure 2: Batch file that lets you keep your WordStar files on a RAM disk (C:) and save them to a floppy (B:) using the much faster DOS COPY utility rather than MicroPro's.

```
WS C:%1
PAUSE
COPY C:%1 B:
%0 %1
```

The pause in the second line lets you quit when you're all done by hitting Ctrl-Break and then answering the "Terminate batch job (Y/N)?" with a Y.

Figure 3: Instructions for changing the "Y delete command to "YY":

1. Put your DOS disk in drive A: and WordStar in drive B:
2. At the "A>" prompt, type in: DEBUG B:WS.COM
3. At the "-" prompt, type in: E 536 (and hit ENTER)
4. The screen should respond with: 00
5. Type in: 19 (and hit ENTER)
6. At the next "-" prompt, type in: W
7. Finally, quit at the next "-" prompt by typing in: Q
8. Then run WordStar and make sure you have to hit "Y" twice before it will erase a line. After you type in the first "Y" it should park one at the upper left-hand corner of the screen. Hit the space bar and it will go away. But hit "Y" again and the current line will vanish.

Figure 4: WordStar function key settings used around the PC offices.

- F1 'KS'QP (Save and return to current position)
- F2 'F (Jump one word to the right) "
- F3 'A'T (Delete one word to the left)
- F4 'T (Delete one word to the right)
- F5 'P'S (Underline)
- F6 'B (Reformat)
- F7 'QS (Move cursor to beginning of line)
- F8 'QD (Move cursor to end of line)
- F9 'QR (Move to beginning of file)
- F10 'QC (Move to end of file)

*Note—F2 jumps a word at a time to the right. To jump to the left, you still have to hit "A", but since the A key is next to the Ctrl key, it's the easiest Ctrl combination on the keyboard.

cases has already made provisions for the necessary stripping. Part of its formatter is in the misnamed MolMerge and not in the program itself. I could use about ten or twenty more function keys and a directory with more information—filesize, date, free space on disk, etc. And it still has a raft of annoying little habits, such as

I_F
*Shakespeare had owned
 WordStar and a PC, he
 would have polished off
 a dozen more plays.*

thinking two words separated by a dash are actually one very long word.

But 3.3 is quick and sleek, and lets me do virtually everything I need without any headache. Nothing else comes close. In fact, I can now write several times as fast as I could before I discovered it, since I can simply leap in and start typing, then do the inevitable block moves, hatchat edits, and amplifications later so quickly and cleanly it makes my head spin. If Shakespeare had owned WordStar and a PC, he would have polished off a dozen more plays. Think about that. It really does help turn writer's block into writer's cramp. When you put out a 700-page magazine, a fast word processor with top-drawer editing capabilities like WordStar comes in awfully handy.

Actually, what I really want is Tecmar's new voice recognition equipment configured for WordStar's editing commands. It works like a charm. Tecmar has been using voice-recognition WordStar internally for some time, and hands-off editing is truly astonishing—if you don't mind being seen barking commands at your PC. "Down!" "Right!" "Reformat!" I love it.

If I'm staring at an onrushing deadline, give me Seymour Rubinstein's muscular word processor and a memory-heavy PC any time. Everything else just doesn't cut the mustard. And version 4.0 of WordStar has us dizzy with anticipation. Wonder what they're cooking up for version 5.0? **/PC**

Save space, improve ergonomics and system life.



The SS-I System Stand by Curtis offers you more freedom of arrangement. Reduces the systems unit footprint by 54%. Use less desktop space, or no desktop space at all—put it on the floor! It feels great. Also, with less disk drive wear in the vertical position, systems unit can be expected to have a longer life and less down time with the SS-I.

Get the sturdy SS-I and stand your systems unit on its ear—it feels great and lasts longer.

Re-arrange your IBM PC ... comfortably

Developed exclusively for the IBM PC, all Curtis products have a lifetime warranty and are a perfect PC match in color, style and finish.

PC Pedestal™ II, Tilt and Swivel Base (for IBM PC Monochrome and Color Displays)	79.95	EC-1 9' Extension Cable Set (for IBM PC Monochrome Display)	49.95
AD-1 Adapter for PC Pedestal™ (for Princeton Graphics Systems and Quadchrome Displays)	9.95	EC-1 3' to 9' Extension Cable (for IBM PC Keyboard)	39.95
SS-I System Stand (for IBM PC System Unit)	24.95		

Manufacturing Company, Inc.

Available at all
ComputerLand Stores
Entre Computer Centers
ComputerMarts
ComputerCrafts
Micro Age
 or your local
PC dealer.

Over 800 locations nationally.

For the dealer nearest you
 call (603) 924-7803.

A104



Computer Workstations by New England Wood Designs,
 Dublin, New Hampshire 03444

Copyright © Curtis Manufacturing Co., Inc.

reduce footprint

**HERE'S WHAT
OUR NEW, 1200-BAUD,
DO IT ALL,
ONE STOP SHOPPING,
DON'T BREAK THE BANK
MODEM FOR YOUR IBM PC
LOOKS LIKE:**

**Introducing the PC: IntelliModem™
from Bizcomp. With your IBM PC or XT,
it looks like a big nothing.**

That's because it's inside. Where any modem connecting your Personal Computer to the telephone network should be. And where you won't have to worry about all those little boxes, couplers, cables and power cords getting in your way. Or being knocked off your desk.

But just because the PC: IntelliModem is out of sight, doesn't mean it'll ever be out of mind. You'll continue to be impressed with its do-it-all capabilities for years to come. Advanced data comm capabilities such as automatic dialing and auto repeat dialing, for selectively calling people or other computers from your own computerized telephone directory. Or automatic answering, so your PC can receive messages even when you're not in the office.

More than just a modem.

Even more impressive is the PC: IntelliModem's ability to *integrate both voice and data communication*. By plugging a regular handset into the back of your PC, you can

So, where is it?



now switch between talking or listening and sending or receiving data—without having to hang up, re-dial or plug and unplug a lot of cables. So making connections is now much faster and more convenient.

The PC: IntelliModem comes complete with everything you need to start communicating immediately. Besides its sophisticated Bell 212A-compatible hardware, the PC: Intelli-

Modem includes a "friendly" software package with screen menus to guide you during use, plus complete written instructions for reference. And all this one-stop-shopping convenience is included in our modest price: \$499. Which shouldn't break anybody's bank.

So if you're ready to turn your PC into a fast-talking data communications tool, ask your local IBM dealer about the Bizcomp PC: IntelliModem. It's a whole lot more than a modem. Even if it looks like a great big nothing.

BIZCOMP®

532 Weddell Drive
Sunnyvale, CA 94086
408/745-1616

PC: IntelliModem is a trademark of Business Computer Corporation. IBM is a trademark of International Business Machines Corporation.

CIRCLE 171 ON READER SERVICE CARD

Should you buy a Mountain hard disk system that:

- ☒ is fully plug compatible with IBM's XT™?
- ☒ upgrades a PC, Compaq™, Corona™, etc. to an XT?
- ☒ insures total compatibility with DOS 2.0 and all future XT software releases, and networks such as PC net™, Ether Series™, and Omninet™?
- ☒ is built with the established Mountain standards of quality and reliability?

Yes!



100M Byte \$2,395.00

Mountain offers 5 to 20M Byte Systems for all IBM compatible computers and for Apple II®, IIe®, III®, and Franklin™.

For more information or a demonstration see your Mountain Dealer, or call toll free 800-538-8157 (In California call 800-672-3470) Ext. 962.

Mountain™
COMPUTER, INCORPORATED



IBM and XT are trademarks of International Business Machines, Inc. Compaq is a trademark of Compaq Computer Corp. Corona is a trademark of Corona Data Systems, Inc. PC net is a trademark of Orchid Technology. EtherSeries is a trademark of 3Com. Omninet is a trademark of Corvus Systems. Apple II, IIe, and III are trademarks of Apple Computer, Inc. Franklin is a trademark of Franklin Computer Corp.

CIRCLE 289 ON READER SERVICE CARD

Why are the Fortune 500 Companies choosing Compucart?



SECURITY • MOBILITY • ADJUSTABILITY

The Compucart holds your PC monitor, keyboard, disk drives, printer, expansion chassis, software and manuals. You lock them safely away with your personal key! Its adjustable design accepts most PC systems, takes only 4 sq. feet of floorspace, and rolls easily wherever needed. Three models in four tasteful colors.

For the executive who may choose, Compucart is the obvious choice.

COMPU-CART®

Manufactured by Versa-Tec Corporation

CIRCLE 199 ON READER SERVICE CARD

Patent Pending

P.O. Box 2095, Tampa, FL 33601-2095 Telephone (813) 251-2431 Call Toll Free 1-800-237-9024

LIFETREE SOFTWARE
creators of

volkswriter®

THE MOST POPULAR WORD PROCESSOR FOR THE IBM PERSONAL COMPUTER

INTRODUCES

VOLKSWRITER
hollywood

with
HORIZONTAL
SCROLLING
TRUE
PROPORTIONAL
SPACING

STARRING

with a returning
cast of
EXTRAORDINARY
SIMPLICITY
LIVE
TUTORIALS

TEXTMERGE

plus

over 1,000,000 characters

DYNAMIC

SPECIAL EFFECTS

- COLOR •
- MULTIPLE FONTS •

SPECIAL EFFECTS

- EMPHASIS •
- SUPER/SUBSCRIPTS •

PAGINATION & PROOFING

Playing on the
IBM/PC, DEC RAINBOW,
TI/PC, VICTOR 9000
with
dBASE II and 1-2-3

only
\$285.00

NOW AT YOUR LOCAL STORE OR CALL



1-800-373-4718

LIFETREE SOFTWARE

© 1983 LIFETREE SOFTWARE, INC. • 411 Pacific, Suite 315 • Monterey, CA • 93940

CIRCLE 365 ON READER SERVICE CARD

Famous "Blues" Guess Who's



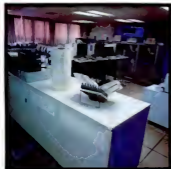
Famous baseball player



Famous 18th century painting



Famous actor with those "Baby Blues" and a taste for salad dressing



Famous "Big Blue"



Famous entertainer, singer and actor with the rich name of "Baby Blue" eyes



Powerful CPM co-processor

The Guessing Game Stops Here.

It's the Z-80 microcomputer you plug into your IBM PC to gain instant access to thousands of CP/M programs . . . languages, programming utilities, and the world's largest library of applications.

No Guesswork in How to Use.

Just plug **Baby Blue** into any expansion slot, run the CONVERT utility, and your CP/M-80 programs execute transparently in your PC. You don't have to worry about which disks are CP/M disks and which are PC-DOS.

Offering you Total File Compatibility.

Your CP/M programs read and write PC-DOS files, so that CP/M and PC-DOS programs can share data with each other. And when you're not using **Baby Blue** to run CP/M applications, its 64K of RAM is still there for your PC.

And the Function Key enables you to move mountains.

Our KEYFIX utility expands the power of your extended IBM PC keyboard. Single keystrokes can move tons of text, or provide standard answers to often asked questions. Our **Baby Blue** also comes bundled with **Micropro's WordStar/MailMerge**, ideally configured for the IBM PC keyboard, or with **InfoStar**, for high-speed, easy to use data base management.

As far as the rest of the "Guess Who's Blues" go, we'll keep you guessing; but for more details see your microcomputer dealer or contact Microlog at:



Baby Blue	\$600
Baby Blue with WordStar/MailMerge	\$895
Baby Blue with InfoStar	\$895

Microlog
A TLI INTERNATIONAL COMPANY

(914) 368-0353 MICROLOG, INC., 222 Rte. 59, Suffern, NY 10901

CIRCLE 267 ON READER SERVICE CARD





WORD PROCESSING/BILL HOWARD

More than any other program, WordStar has led to a proliferation of training aids: guidebooks, tutorial diskettes, instructional cassettes, and templates.

WordStar Teaching Aids: The Whole Works

When a new word processing program appears on the market, chances are it's going to be compared to WordStar. MicroPro's nearly 5-year-old program has become something of a benchmark for its power, flexibility, and the number of copies (over 500,000) running on personal computers. In fact, the number of pirated copies alone is probably greater than many other manufacturers' legitimate sales.

So why isn't WordStar used with every computer ever built? Aside from its price—not everyone wants to spend \$495, plus \$250 for a companion MailMerge program—and the presence of some other fine word processing programs on the market, many people

find that WordStar is a bear to learn. MicroPro describes its product as "user friendly" and "easily installed by computer novices." Henry Youngman should be so funny: if the truth be known, getting WordStar up and running, let alone actually using it, is a complex task for the novice.

ONE
evening spent with any
of the cassette or disk
tutorials is enough to
make most anyone feel
comfortable with
WordStar.

Between WordStar and MailMerge, there are nearly 180 commands. Hitting a key simultaneously with the Ctrl key has one function, while hitting a two-key sequence has another. This is not a program to learn by the "lessee what this key does—oops" method. And MicroPro's WordStar manual, until a recent revision, was little help.

Fortunately, private entrepreneurs have stepped in to give MicroPro a helping hand, and there are numerous ways to learn WordStar: guidebooks, instructional programs on diskette and cassette, keyboard templates, videocassettes, and even an improved manual from MicroPro. Currently, they range in price from 50 cents to \$75, but the figure will reach \$200 once WordStar videocassette tutorials become available later this year. All of these instructional aids are helpful, some more so than others.

If you bought WordStar and are having trouble getting the hang of it, this article will direct you toward a number of helpful sources. Of course, "helpful" is a subjective term; each user has different needs, and each WordStar aid has a different way of approaching those needs. We'll examine and rate each of the training guides. If you haven't bought a word processing program yet and are considering WordStar, a book is probably the cheapest way to find out if WordStar is for you.

A word of encouragement: One

Figure 1: A quick reference appendix of Naiman's Introduction to WordStar gives a summary of the block commands. This is the book's most outstanding feature.

APPENDIX O 161

Marking Places and Handling Blocks

Placemarkers

Command:



Function:

Insert a numbered placemaker <0> to <9>.

Hide or move a numbered placemaker.

Find a numbered placemaker.

Marking Blocks



Mark the beginning of a block ().

Mark the end of a block (<K>).

Finding Blocks



Find the beginning of a block ().

Find the end of a block (<K>).

Find the previous position of block that was copied, moved, or deleted.

evening spent with any of the cassette or disk tutorials is enough to make most anyone feel comfortable with WordStar. You need only to learn approximately 20 commands to edit and print most documents. Once learned, WordStar is easy to use, more so than such easy-to-learn programs as Select.

Every training aid begins by explaining how to get WordStar into the computer, and goes on to explain such things as understanding the menus, opening a file, entering text, moving the cursor, correcting those inevitable mistakes, saving text, printing, and the more complex commands. Except for the disk tutorials, all the aids explain MailMerge. Some include information on operating systems (though not necessarily IBM's) and care and feeding of computers.

The Guidebooks

The guidebook approach to WordStar is

not as painless a learning approach as the cassettes or disk tutorials, but, when it's time to double-check a concept, especially in the middle of a WordStar file, you'll need to reach for a book.

Introduction to WordStar by Arthur Naiman is at the head of the class. This book is a gentle teacher, mildly humorous, never condescending. (Make sure you get the second edition, which includes an eight-page appendix listing WordStar function keys on the PC.)

Naiman does a good job of explaining what happens if you do something you're not supposed to. The few examples to type in are given within the text, rather than as separate exercises at the end of the chapters. He suggests correcting mistakes as you go along, which is a more natural process than entering material, typos and all, and then going back as some other guides advise.

Several excellent appendices at the

Get all the facts about the IBM Personal Computer.

Get PC™ Magazine!

Whether you already own an IBM Personal Computer or you're thinking about buying one, you need PC Magazine.

PC Magazine is the independent guide to IBM Personal Computers. Each monthly issue is packed with the latest information for everyone who's interested in IBM Personal Computers.

This is the magazine for finding out how to put together the best IBM "PC" system...and how to get the most out of it. Every month you'll receive hundreds of colorful pages of evaluations, insights, and straight talk from respected experts—professionals in computer science as well as lawyers, businessmen, writers, educators and many others.

PC covers software, hardware, applications, and every other topic of importance to the thousands of IBM Personal Computer users who read it. To make sure that we give you the facts you need, we include a special "User-to-User" section, a "PC Wish List," and news about IBM Personal Computer clubs, events and publications.

Right now you can save up to 33% on an introductory subscription. And if you're ever dissatisfied with PC, just write and tell us—you'll receive a prompt refund for all the unmailed issues remaining in your subscription.



P.O. Box 2443, Boulder, CO 80322

Yes!

I want to subscribe to PC, the independent guide to IBM Personal Computers:

- ☐ One year (26 issues) only \$39.97—14% off
- ☐ Two years only \$52.97—24% off
- ☐ Three years only \$69.97—33% off

Savings based on full one-year subscription rate of \$34.97.

CHECK ONE: ☐ Payment enclosed. ☐ Bill me later.

45101

Mr./Mrs./Ms. _____
(please print full name)

Company _____

Address _____

City _____ State _____ Zip _____

Offer valid only in the U.S., its territories and possessions. Please allow 30 to 60 days for delivery of first issue.

WordStar: One Thing the Manuals Left Out

What are those mysterious periods and colons doing at the bottom and top of your file?

"What are all those colons and periods doing at the very top and bottom of my file? Am I inserting blank lines by mistake? Will they print out? Did I foul up the program?"

Although the concern over colons and periods is a common one, and the answer is simple, most of the WordStar guides ignore or gloss over the question.

The answer: If you try to scroll beyond the ends of a file, WordStar (instead of refusing to scroll any farther) keeps on going and inserts a line that is blank except for a colon (top of the file) or period (bottom) in the far right column of the screen. Up to 23 such lines can show up before WordStar quits fooling around. The lines end colons/periods are harmless;

they won't print, but you can't move your cursor into the offending areas to delete them. However, you can scroll in the opposite direction to make them go away.

The colons also show up in three other situations, all when you're at or near the top of the file. Again, they cause no harm, just confusion. If the main editing menu is on, and you turn it off, the colons appear. If the main menu is already off and an auxiliary menu (print, block, etc.) comes on, the colons pop up as soon as the menu goes away. Finally, they show up when you interrupt a function and have to get out using the escape key. A printout showing the mysteriously appearing colons and dots follows.

—B.H.

special keys.

Ertlin covers MailMerge (in more detail than Introduction to WordStar), SpellStar, and CP/M, but not IBM's CP/M-86. A handy cardboard chart of WordStar commands detaches from the back of WordStar Mode Easy.

Sybox, which publishes Introduction to WordStar, has a new book out, Practical WordStar Uses, by Julie Anne Arca, which provides some specific examples of how WordStar can be used and takes the user step-by-step through them. The book includes a WordStar commands poster, which is particularly useful to those already somewhat familiar with WordStar.

Using the IBM Personal Computer: WordStar, by C.J. Puotinen, comes with a diskette of text examples for editing practice, sparing PC users who already know how to type the agony of typing practice. So far, it's the only book that integrates discussion of IBM PC keys into the main text. And what a text it is: 357 pages, without a single illustration. Not until page 81 do you learn how to delete a character. PC-DOS is covered, but there isn't enough room to squeeze in MailMerge or SpellStar.

The back cover, usually reserved for kudos from reviewers, is given over to what appears to be an innovative index: match a block bar for the topic you want with a corresponding block bar inside the

```
B:TEST PAGE 1 LINE 1 COL 01      MAIN      INSERT ON
<<< >>>
--Cursor Movement--  | -Delete- |  M E N U      | -Other Menus-
"8 char left "D char right | "G char | "I Tab "8 Reform | (from Main only)
"A word left "D word right | "DEL chr lf | "V INSERT ON/OFF | "J Reap "8 Block
"E line up "7 line down | "7 word rt | "L FIND/Replic again | "Q Quick "P Print
--Scrolling--         | "7 line | RETURN End paragraph | "O Onscreen
"2 line up "7 line down | "N Insert a RETURN |
"C screen up "R screen down | "U Stop a command |
L-----|-----|-----|-----|-----R
```

back of the 202-page book summarize keyboard commands with sketches of the keys (see Figure 1), page formatting dot commands, and MailMerge commands. You'll find yourself referring to these frequently as they have a bit more substance than a simple commands chart. MailMerge and SpellStar are covered.

The cover trumpets the words revised second edition, but the only change is the addition of an 8-page IBM PC appendix. An error from the first edition carries over; it's still on page 174, and states that, in MailMerge, typing in &Name/O omits a line if there's no data for a person's name, when in fact the correct sequence is &Name/O&.

A half dozen changes would make Introduction to WordStar superb. They should include integration of IBM specifics throughout the main text, updates to reflect WordStar 3.2.4 and 3.30 (it's written for 3.0), a bit more on MailMerge (print-

time line forming commands are omitted), cross-references to the MicroPro manual, stick-out index tabs for rapid reference, and a pullout card listing commands.

If you have only ten bucks to spend learning WordStar, spend it on Introduction to WordStar.

WordStar Mode Easy is the original nonMicroPro WordStar guide. There are exercises at the end of each chapter, which may remind the user of grade school. (Fortunately, there is no dress code and no morning pledge of allegiance to the flag.) The listing, however, could be more lucid.

Since no mode-EZ manual is going to have the depth of the manufacturer's documentation, author Walter A. Ertlin wisely cross-references each paragraph or concept to the correlating one in the WordStar manuals, but, unfortunately, he gets only as far as version 3.0. Also, no mention is made at all of the IBM PC and its

I
IF YOU
have only ten bucks to
spend learning
WordStar, spend it on
Introduction to
WordStar.

book, and you're there. Neat idea, except the bars don't line up with the topics. Also, instead of CR or Return to indicate a carriage return, the book uses the @ symbol. (At least this book uses caret symbol ^, for control, while others use the up arrow ^, which is easily confused with the IBM PC's up-arrow shift key.)

SIGMA DESIGNS:

Your Full Line IBM PC Expansion Products Supplier



Expansion Chassis/Winchester Disk Subsystem



Subsystem with Two Drives



SDI-ESC + Memory & Stack Board



SDI-SSC Card

The Sigma Expansion Chassis/ Winchester Disk Subsystem:

- Consists of an expansion chassis, one or two Winchester disk drives, and software running under DOS 1.1 & 2.0.
- The Chassis' Expansion Board allows up to 9 add-on function cards, and features a heavy-duty 100W switching power supply.
- When operating under DOS 2.0, the SDI Winchester software can access either one(1) or two(2) 5, 10, 15, and 34 MB 5 $\frac{1}{4}$ " Winchester disk drives.
- The subsystem is supplied as an Expansion Chassis only, Expansion Chassis with one drive, or with two disk drives.
- Other features include a super quiet fan, shielded interface cable, Driver and Receiver Logic cards to buffer all signals between PC and subsystem, and easy installation.

More Value For Your Dollars:

• Expansion Chassis (Only)		\$795.00
• Subsystem w/ One Drive	• Second Drive	
5 MB	5 MB	\$ 895.00
10 MB	10 MB	1095.00
15 MB	15 MB	1295.00
34 MB	34 MB	2095.00

The Sigma family of add-on cards:

- SDI-ESC + Memory: Socketed memory up to 512K (with Stack Board), RS-232 async. port, parallel printer port, clock/calendar, game adapter. Extra async. port when used with Stack Board. \$395.00 at 64KB.
- SDI-SSC: Same as above, but without memory. The perfect addition to your new 256K PC or XT! Retail at \$265.00. Call your dealer for additional products and price information.

ONE YEAR WARRANTY • DEALER INQUIRIES WELCOME



SIGMA DESIGNS, INC.

2990 Scott Blvd • Santa Clara, CA 95050 • (408) 496-0536 • TELEX: 171240

CIRCLE 401 ON READER SERVICE CARD

Using the IBM Personal Computer: WordStar begs the question: Is the world ready for a \$40 book that's 103 pages longer than WordStar's own manual? Puntinen also wrote *The Last Word on WordStar*, essentially the same book but for CP/M machines and without the text diskette. It's a mere 317 pages.

Pocket Guide to WordStar is a cross between a book and a reference guide. Visually, it looks like 96 postcard-size, postcard-stiff pages bound together into a vertical spiral notebook. The cover is an unforgettable checkerboard of colors, heavy on the oranges. Inside, there are brief descriptions of WordStar's features

making WordStar files compatible with other word processing systems. The Pocket Guide is probably best for the PC user running WordStar under CP/M-86 but not under PC-DOS.

The Illustrated CP/M-Wordstar Dictionary would appeal most to an IBM PC user running WordStar through an 8-bit Z80 adapter card such as the one manufactured by Baby Blue. Rather than chapters, the book is divided into 75 modules; each is two or three pages long and covers a specific topic. MoilMerge and SpellStar are covered, as is CP/M-80. Illustrations abound—many of them look like diagrams of football plays, with arrows indicating the cursor's movement. Not bad, once you get used to them.

MicroPro's Documentation

The proliferation of WordStar learning aids is due in no small part to the old, notoriously inadequate (version 3.24 and earlier) WordStar manuals. The original was comprised of a loose-leaf notebook with a brief general overview of WordStar, an installation section that might as well have been in a foreign language—followed by a reference section expending on the overview. One never was sure whether to look up a topic in the overview or reference section. The original manual had only a handful of illustrations, no index for the overview or reference sections, and the writing was almost incomprehensible. The manual was prepared using WordStar, printed on a Super Courier daisy!

B_E
careful not to
inadvertently hit the Esc
key; if you do you will
be unceremoniously
excited from the
program.

thimble printer, and dutifully photocopied half a million times for half a million customers.

In mid-1981, WordStar introduced The MicroPro Training Guide in the form of a giant steno-pad book. It covers WordStar, MoilMerge, SpellStar, but not StarIndex, MicroPro's intriguing new table of contents/indexing program. It was better than nothing, but no match for the subsequent stream of WordStar books from other manufacturers.

The big change in documentation came with WordStar 3.3, released in July 1983. It moves MicroPro's documentation rating from near bottom to the upper crust. The old general overview and reference sections are combined into one, resulting in an easier-to-read Reference Manual, with graphics and cartoons, followed by the Training Guide, which is only modestly revised, and a greatly simplified Installo-

THE
inside cover of the
WordStar 3.3 Manual
warns, in six languages,
that you're in a heap of
trouble if you're caught
duplicating a MicroPro
product.

and functions, plus explanations of CP/M-80 and CP/M-86. Some of the practical tips are handy, such as the discussion of



DATAEASE

IBM PC Software

Write/call for information.
CA +6.5%

RETAIL SALES CONTROL Turn your computer into a cash register. This "point of sale" system is a comprehensive method to control low to medium volume retail or discount sales. Customer, inventory and employee (commissions & sales) files are automatically updated. Amount tendered, stock status, credit card sales control, sales tax receipts and sales analysis are among the features.

PRODUCT INVOICING This system allows you to quickly create invoices for materials billing while it keeps track of your inventory. The Item file tracks quantity sold as well as the cost, list, discount prices. Reorder point is a function of the stock status report.

COLOR DISKETTES Top quality diskettes in red, green, yellow, blue, burgundy, silver, tan, brown and orange in 5 1/4" and 8". Call for prices.



DEALER INQUIRY
WELCOME

RETAIL SALES CONTROL	\$295
WORK & TIME BILLING	\$245
DATABASE MANAGEMENT ...	\$195
TIME & MATERIALS INV	\$195
PURCHASE ORDER CTL	\$195
PRODUCT INVOICING	\$195
MAIL ORDER CONTROL	\$95
INVENTORY CONTROL	\$95
DATA ENTRY & EDIT	\$75
MAIL LISTS & LABELS	\$75
PROGRAMMER UTILITIES	\$50
SCREEN DESIGN AID	\$35
TELEPHONE DIRECTORY	\$35
BAR GRAPH GENERATOR	\$35
MENU DESIGN AID	\$15

Data Consulting Group 877 Bounty Dr. #E203
Foster City, CA 94404 (415) 571-8100 349-4001

Business Decision.

Let's be honest.

Despite the "personal computer revolution" in today's office, a lot of business decisions get made in some pretty arbitrary ways.

That's because most of the *software* for personal computers isn't up to the job of helping you draw conclusions from the mass of information in your business.

THE GREAT PERSONAL COMPUTER "UN-REVOLUTION."

Up to now, to use a personal computer effectively in the real world, you needed to use five different types of software packages: Electronic spreadsheet, information management, graphics, word processing, and telecommunications.

You had to learn how to use these five different, unmatched software packages before you could make the computer do what you wanted it to do. And information stored in one of these packages would rarely fit into another without a lot of trouble. This means you had to spend your valuable time pushing buttons and learning to become a computer expert.

Instead of using the personal computer as a tool for business decisions.

Not exactly a shining moment in the personal computer revolution.

THE CONTEXT MBA™

A SIMPLE IDEA WHOSE TIME HAS COME.

The Context MBA is software for the IBM PC, PC-XT, and Hewlett-Packard Series 200 personal computers that combines all the functions you'll ever need - spreadsheet, information management, report writing, graphics, and communications - into a single, easy-to-use package.

The result is a software package that's literally "greater than the sum of its parts."

FIVE SCREENS - NO WAITING.

With the MBA you can connect your personal computer to your company's main computer and retrieve all kinds of business data. Like sales, product, or customer figures.

Sort, search, update, and store this information in your personal computer. Analyze it, prepare sales forecasts or study new business opportunities in



minutes, instead of hours.

While you're using the spreadsheet, use the MBA's graphics function to make spreadsheet figures come alive on your screen in charts or graphs. So you can visualize the effect of possible changes to your business.

This year, or five years from now. Instantly. When you've made sense out of the possibilities, use the MBA's full-function executive report writer to put these words, numbers, and graphs into a finished, printed report.

At last, you can use a personal computer as a decision tool to turn more profit from the mountain of information that crosses your desk every day.

So now even "non-computer people" can make heads-or-tails out of the personal computer revolution.

A GOOD BUSINESS DECISION.

Make a good, well-informed business decision right now!

Call us at 1-800-437-1513 (in California, call 1-800-592-2527), and get the name of your nearest computer store for a live demonstration of the Context MBA. We'll also send you a copy of our tell-it-like-it-is brochure, *Software Explained*.

If you have an IBM Personal Computer, ask for our free *Context MBA Sampler Disk* for a live demo of the MBA on your own PC.

CONTEXT MANAGEMENT SYSTEMS
23868 Hawthorne Blvd.
Torrance, CA 90505
(213) 378-8277

Context
MBA™

Personal Computer Software for Business Decisions.

CIRCLE 195 ON READER SERVICE CARD

BISINESS

SPOKEN HERE

We are Bristol Information Systems, and since 1971 we have been writing accounting software for large companies using minicomputers. Recently, we began putting these powerful systems on the new microcomputers. The result is "BISINESS" — software packages that MEAN BUSINESS.

With "BISINESS" software your business can have all the data processing power that major corporations have — because you're getting the SAME software, not scaled-down versions. Every "BISINESS" system is *comprehensive* enough to offer all the features any business could want. Yet with our System Configurator, every "BISINESS" system is *flexible* enough to let YOU select which features you want to use. So you can still do business your way — only better!

Before you buy business software ... find out what "BISINESS" has to offer. You will be truly amazed.

Dealers — Ask about our Dealer Support Program!

Remember



means



ADVANTAGES OF "BISINESS" SYSTEMS

- Lifetime Warranty
- Comprehensive Accounting Features
- Flexible Configuration Set-Up
- Menu-Driven with "HELP" Screens
- Telephone Hot Line
- Password Security
- Unlimited File Size
- Multi-File, Multi-User, Multi-Company
- Available for PC-DOS™, MS-DOS™, and CP/M™
- Complete Integration with Other BIS Systems
- Detailed Management Information
- Revision Service

"BISINESS" SYSTEMS FOR YOUR BUSINESS

- General Ledger
- Payroll
- Accounts Payable
- Accounts Receivable (Open Item and Balance Forward)
- Inventory Management
- Fixed Asset and Equipment Management
- Purchase Order
- Professional Time Accounting
- Mailing List/Letter Writer
- Wholesale Order Billing
- Construction Cost Accounting
- Property Management
- C.P.A. Client Write-Up and Office Management
- Legal Office Management

BIS

BRISTOL INFORMATION SYSTEMS, INC.

84 North Main Street, Fall River, MA 02720

Telephone (617) 679-1051 CIRCLE 163 ON READER SERVICE CARD

PC-DOS, MS-DOS, and CP/M are the trademarks of IBM, Microsoft and Digital Research respectively.

tion Manual. It's now typeset and printed on 6-by-9 paper. Its unusual size makes the photocopied, pirated copies easy to spot. Its IBM-reference-sized, black D-ring binders "make an impressive appearance on retail shelves," in MicroPro's words. The inside cover of the WordStar 3.3 manual warns, in six languages, that you're in a heap of trouble if you're caught duplicating a MicroPro product. There's also a cardboard command chart.

The new manual is vastly improved, but you'll probably still want a second viewpoint on learning WordStar. A few of the concepts still are not explained clearly enough, and some key points are confusing, not covered, or mentioned only casually. For instance, no explicit information is given on the line-height command needed to specify double-spacing. It assumes you intuitively know that .LH 16 is WordStar talk for double spacing. The section on soft hyphens (hyphens that print only at the ends of lines) uses French in words in the examples, which makes it appear that soft hyphens are used only in that language.

The Reference Manual (the section of the documentation that explains how to use WordStar) has ten chapters. Each chapter is marked with a blackened block with the name of the section given in reverse type at the page edges for relatively easy location. To make the manual easier to use, I suggest inserting ten plastic or cardboard subject dividers, and either moving the command summaries from the

end of the chapters to the beginning, or moving them all to the front of the book. Also, remove the first four title sheets so the first page you come to when opening the book is the contents page.

Disk-Based Tutorials

The makers of diskette-based instructional programs use the computer-as-instruc-

TO LOG onto the two-disk second course, Command Power, requires DOS in drive A.

tor approach and would argue that it is the only sensible one. You can operate the tutorial at your own pace, and it tells you whether you hit the right keys. The makers of cassette-based instructional programs, however, point out that the disk tutorials merely simulate WordStar.

Both the diskettes and cassettes have their merits. Disk tutorials certainly are handier for reviewing specific lessons. Cassettes, however, make use of an additional sense—hearing.

Disk tutorials require letter-perfect input. For instance, none of them budges

unless you type two spaces, not one, between sentences. And be careful not to inadvertently hit the esc or E keys; if you do you will be unceremoniously exited from the program without so much as an "Are you sure?" prompt.

The three-disk American Training Institute (ATI) Training Power tutorial course comes in two volumes: ATI WordStar Menu Power Vol. I (1 disk) and ATI WordStar Command Power Vol. II (2 disks). The program is generic; it doesn't cover special IBM PC functions on disk or in the two cardboard-jacketed reference books, which cover menus, basic cursor movement, text entry (Menu Power) and more complex commands (Command Power).

The ATI tutorial is somewhat stodgy. It works, but you have to work at it and do things its way. To some, the comparatively rigid structure of the course may be an advantage; to others, it is a drawback. For instance, to move to the left side of one practice line, you must move the cursor left by pressing Ctrl-S 15 times, rather than by typing WordStar's handier Ctrl-A (for word-left) or Ctrl-QS (left-side-of-line).

To log onto the two-disk second course, Command Power, requires the user to bring up DOS in drive A, log onto drive B, then change disks and run the program CPOWER in drive A.

The ATI programs come in two red cardboard slipcases, which enclose second and third slipcases, which enclose folded card-

WORRIED?

Your data is in danger without the powerful file recovery routines in the Norton Utilities.

Protect your data

with the essential file recovery routines

- Recover erased files
- Recover from damaged diskettes
- Recover scrambled data

Dozens of extra functions included in the Norton Utilities

- Disk labeling
- Screen control
- Sound, timing, file printing, and more!



SNOOPY?

Explore your disks

and learn the mysteries of disk data with the Norton Utilities.

Explore your disks

with the powerful and educational snooping tools

- map disk formats
- Browse through all files
- Explore and patch all disks

Works on ALL models of IBM
Works on ALL versions of DOS!

"Nothing short of superb!"

— P.C. Age

You can't afford to be without them!

The Norton Utilities Power Tools for the IBM/PC

Available from ComputerLand, other dealers, and directly from me for \$80.00.

Peter Norton 2210 Wilshire Blvd., #186D, Santa Monica, CA 90403

PHONE ORDERS — (213) 399-3948

CIRCLE 346 ON READER SERVICE CARD

Top 30
SOFTWARE
POPULARITY
WINNER!

Programming International

outside CA

(800) 222-8811

inside CA

(800) 631-4400

Over the phone

or

Face to face

SOFTWARE

to go

either way—

your best choice

LOCATIONS:

California

Palo Alto, CA 94301
(415) 234-1099

1370 E. Walnut Street
Pasadena, CA 91105
(213) 304-9144

16168 Beach Blvd
Suite 101-B
Huntington Beach, CA 92647
(714) 840-5555

New Jersey

Two Executive Drive
Fort Lee, NJ 07024
(201) 855-9184

1930 E. Marlton Pike
Cherry Hill, NJ 08003

opening soon:

Chicago, IL
Pittsburgh, PA
Detroit, MI
Cleveland, OH
Denver, CO
Kansas City, MO
St. Louis, MO
Dallas, TX
Houston, TX

New Hampshire

311 Taggart Dr. (off Daniel Webster Hwy)
Nashua, NH 03060
(603) 888-0331

Maryland

Montrose Professional Park
8204 Montrose Rd
Rockville, MD 20852
(301) 770-1042

Store Hours:

10-7 Monday thru Friday
10-5 Saturday

dBASE II\$389

Smartmodem 1200B\$439

Quickcode\$195

Multiplan\$198

Lotus 1-2-3\$369

Programming International

outside CA (800) 222-8811 Inside CA (800) 631-4400

IBM PC SOFTWARE (PC/MS DOS)

Business

American Trading

Power for PC DOS

Adrian's

Financial Planner

Friday

Japan Software

Grammar

ProMaster 20K

ProMaster 50K

ProMaster 80K

Real Products

Personal Finance Pgm

Comprehensive Software Support

PC Tutor

Continuous Software

PCMA (First Class Mail)

Home Accountant Plus

Apple Software Publishing

Money Pack Vol. 1 & 2

Amazing Technology

Eds

Words

Eds + Words

Eds/Works/Spells

Real Estate Analyzer

Information Unlimited Software

Easy Planner

Easy Scheduler 3

Easy Writer II

LearnIt

Spellfinder

Libraries

Midwinter

International Newsletter

More of the Editors

The Final Word

Midwest

Benchmark Mail List

Benchmark

Word Processor

Alpha Pro

Mailmerge

Spelling

WorldMail

WorldSpell

WorldSpellMail

Wordstar

Wordstar II

Wordstar III

Wordstar IV

Wordstar V

Wordstar VI

Wordstar VII

Wordstar VIII

Wordstar IX

Wordstar X

Wordstar XI

Wordstar XII

Wordstar XIII

Wordstar XIV

Wordstar XV

Wordstar XVI

Wordstar XVII

Wordstar XVIII

Wordstar XIX

Wordstar XX

The Word Plus

PGI Corporation

Personal Investor

Positive

QUEST 4 PAK

Software

Software Systems

Software World Processor

Software Inc

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Software

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

Upper Reaches

board reference books. Compared to vinyl binders (CDex and FlipTrack, for instance), the cardboard appears shopworn. When everything is opened and spread on a desk, there's so much cardboard lying around, it looks like the remnants of a McDonald's—Did a tree die for this?—lunch.

The CDex WordStar Training Program is a joy to use. There are graphics of sorts (even on the PC's monochrome display) and options to simulate WordStar 3.24/3.21 or WordStar 3.3. Each of the eight topics can be reviewed quickly (2 to 3 minutes) or in greater detail (10 to 15 minutes claimed).

Sprinkled through the CDex course are multiple-choice questions, each with the options of answering the question immediately, reviewing the material first, getting a hint before answering the question, or skipping the question and continuing. A wrong answer is followed by an explanation and a chance either to answer the question again, or to skip along.

At the end of the topic (chapter), there

How 3.3. Differs from Earlier Versions

A list of the revised WordStar commands.

If the training guide you buy doesn't cover WordStar 3.3 or the PC's special keys, here's a list of the changes from ear-

lier WordStar versions. You can use the special PC keys or the generic WordStar keys interchangeably.

IBM PC Key	WordStar 3.3 Command	What It Means
↑, ←, →, ↓	'E, 'S, 'D, 'X	Cursor movement
PgUp	'R	Scroll up 1 screen
PgDn	'C	Scroll down 1 screen
Home	'QE then 'QS	To home pos. this screen
End	'QX	Bottom of this screen
F1	'JH	Set help level
F2	'OG	Temporary indent to tab
F3	'OL ESC	Set left margin at cursor
F4	'OR ESC	Set right margin at cursor
F5	'PS	Underline
F6	'PB	Boldface
F7	'KB	Mark beginning of block
F8	'KK	Mark end of block
F9	'QR	Cursor to beginning of file
F10	'QC	Cursor to end of file

IT'S SIMPLE. . .CALL AND SAVE MONEY!

Since 1978

1-800-841-0860

GA. & INFO
912-377-7120

WE SELL
IBM-PC COMPATIBLES
CALL FOR YOUR CHOICE

EAGLE PC COLUMBIA PC

CORONA PC
\$CALL

PRINTERS

EPSON **star**
OKIDATA **TRS-80**
SEI **SMITH CORONA** **C. Itoh**

\$CALL

**TELEMARKETING COMPUTERS
AND EQUIPMENT
TO SAVE YOU MONEY**

FREE UPON REQUEST

*DISCOUNT PRICE LIST AND INFORMATION KIT
*COPY OF MFR'S WARRANTY
PRICES AND PRODUCTS ARE SUBJECT TO CHANGE
WITHOUT NOTICE

* PIONEER IN DIRECT TO CONSUMER SALES OF MICRO COMPUTERS AND ELECTRONICS • NAME BRAND PRODUCTS • LARGE INVENTORIES • NEXT DAY SHIPMENT ON MOST PRODUCTS.



**Micro Management
Systems, Inc.**

DEPT. NO. 40

2803 Thomasville Road East
Cairo, Georgia 31728
(912) 377-7120

TRS-80 COMPUTERS

MODEL 100.. From '677

**WE CARRY THE COMPLETE
LINE OF TRS-80 COMPUTERS**

PURE RADIO SHACK EQUIPMENT

\$CALL

EQUIPMENT



Novation

Commodore

Verbatim
USI

AMDEK

COMREX

Hayes

MICROTEK
GRAPPLER+

\$CALL

CIRCLE 526 ON READER SERVICE CARD

The WordStar 3.3 Opening Menu used to be called the "No File Menu." It's the same menu, aside from the name change.

Pressing Ctrl-R (scroll up one screen) still does the same thing—it displays the previous screen, the one closer to the top of the document. Before version 3.3, it was described as "scroll down one screen," as if a printed roll was moved down past a tiny window so you could see what was higher up on the roll. It's equivalent to the PgUp key.

Ctrl-C—"scroll down one screen" in version 3.3—used to be called "scroll up one screen." It's equal to the PgDn key and displays the next screen, the one closer to the bottom of the file.

The effects of F9 (cursor to beginning of file) and F10 (cursor to end of file) in version 3.3, were the other way around in earlier versions.

To delete a character to the left of the cursor, use DEL if the keypad is shifted for the cursor movement keys. If the keypad is shifted to enter numbers, Ctrl-Backspace (use the backspace key above return, not the keypad's cursor-left key ←) always works. To delete the left side of the line, use Ctrl-Q Backspace. The generic Ctrl-Q Del won't work.

—B.H.

is an exercise listed in the accompanying 97-page guidebook. To run them, you must suspend CDex and run WordStar. (This inconvenience is not encountered with a cassette program.)

The CDex WordStar tutorial comes on four diskettes, but since only one drive can be used, much disk swapping goes on. The disks and booklet are nicely packaged in a black vinyl binder encased in shrink wrap.

Two CDex oddities: Instructions on how to insert the disks are given on the disks. And, CDex comes with the standard "if you don't like our license agreement, don't open this package" warning. Guess what you have to open to find the note?

WordTutor is a disk tutorial developed by MicroPro, possibly as a free addition to the WordStar program. (MicroPro is uncertain whether to make it a freebie or extra-cost.) Eventually, WordTutor will be a six-lesson tutorial, but it won't cover MailMerge. PC obtained an advance look at the first WordTutor lesson. While much shorter than the ATI tutorial or CDex, it

PYXEL Presentations! Maximum Quality ... Minimum Effort



PYXEL Visuals lets you create screens with text in 4 character sizes (1/4" to 1" high) and drawn lines. Reposition any part of the screen with cursor controls. Fully interactive design and edit capabilities. Print horizontally or vertically.

There are no commands (not one!) to learn — or forget! You select the action with the function keys and manipulate the image you see on screen. It's easy — and fast.

Our new BATCHPRINT utility (used for the headline of this ad) lets you print PYXEL Visuals screens in the highest possible resolution on an EPSON or IBM Graphics printer. Create and edit a list of screens (SHOWTIME compatible) then print them while you get a cup of coffee.



The SHOWTIME utility, included with PYXEL Visuals, lets you link screens together and create a free-running show. You choose the time between screen changes. Or use prompt mode to step forward to each screen or go back to a previous screen.

Requires: IBM PC with PC-DOS 1.28K RAM Color/Graphics Adapter Graphics Monitor EPSON MX-100 MX-80 with GRAFTRAX FX-80 IBM Graphics Printer DOS 2.0 and XT compatible

PYXEL

APPLICATIONS

2917 Mohawk Dr.
Richmond, VA 23235
(804) 320-5573

PYXEL Visuals - \$98
BATCHPRINT - \$75
MasterCard/Visa Accepted

StarLogic Announces Savings on IBM PC Compatible Disk Drives Under 2.0 DOS

Internal 5¼" Floppy Drives

Standard-sized drive, plug compatible with IBM PC and IBM PC XT

Tandon single-sided drive—180K bytes	\$165
Tandon double-sided drive—360K bytes	\$235

Internal Half-Height 5¼" Floppy Drives

Single drive configuration double-sided drive 360K bytes	\$225
Dual drive configuration two double-sided drive 720K bytes	\$460

5¼" Winchester DiskSystems® From Interface Inc For Your IBM PC

Includes Winchester drive, cabinet, power supply, cable, controller, I/O adapter and device driver. Compatible with 2.0 DOS.

10 Megabyte formatted DiskSystem	\$1375
15 Megabyte formatted DiskSystem	\$1775
25 Megabyte formatted DiskSystem	\$2175

5¼" Winchester Backup or Additional Storage For Your IBM PC XT or IBM PC DiskSystem.

Slave compatible with 2.0 DOS	
10 Megabyte formatted storage	\$1225
15 Megabyte formatted storage	\$1425
25 Megabyte formatted storage	\$1925

Telephone Orders Only
MasterCard, VISA or
Cashier's Check COD
(213) 883-0587

StarLogic

20932 Cantara Street
Canoga Park, CA 91301

IBM is a registered trademark of IBM Corporation
DiskSystems is copyrighted by Interface Inc
Prices are subject to change without notice

CIRCLE 407 ON READER SERVICE CARD

LEARN TO SPEAK



Logo is the computer language that's sweeping the country with its simple "turtle geometry" way of learning computer literacy. And *Logo: An Introduction* is the new, easy-to-understand beginner's guide that makes learning and using Logo fun!

Written in simple language and set in big, easy-to-read type, *Logo: An Introduction* is specifically designed to be used by teachers and students who have little or no knowledge of Logo or computers.

Logo: An Introduction helps computer novices with

- △ Creating simple shapes with the turtle and combining them to make more complex geometric forms
- △ Learning about "soft" and "hard" saves (temporary and permanent computer memory)
- △ Playing with symmetry and curves
- △ Learning about arithmetic, logic and Cartesian coordinates
- △ Using the idea of recursion—making a simple command repeat itself to perform more complex functions
- △ Experimenting with words and sentences—and more!

Logo: An Introduction doesn't bog you down or scare your students with complex technical details the way instruction manuals do. Instead, this book is written in an open-ended, exploratory style that captures the flexible spirit and freedom of Logo.

Use *Logo: An Introduction* as a supplement to your programming manual as a sourcebook of ideas, as a primer on how to exploit the potential of this powerful language, and as a treasurehouse of suggestions for experiments with Logo. *Logo: An Introduction* is one book that belongs in your classroom or computer lab—and at only \$7.95, it's easy to order more than one, and

pass copies around to your students. Fill in and mail the coupon today, and enter the exciting world of Logo!

NEW FROM THE PUBLISHERS OF CREATIVE COMPUTING
Only \$7.95!

- Large, easy-to-handle 11" x 8½" format
- Written by a professional educator
- Full of illustrations, examples, hints and tips, suggestions and explanatory notes



CREATIVE COMPUTING PRESS

Dept. REC2H, 39 East Hanover Avenue, Morris Plains, NJ 07950

Please send me _____ copies of *Logo: An Introduction* for \$7.95, plus \$1.50* shipping and handling each. #12L

☐ PAYMENT ENCLOSED \$_____ (CA, NJ and NY State residents add applicable sales tax)

☐ CHARGE MY:

☐ American Express ☐ MasterCard ☐ Visa
(Charge orders \$10 minimum)

Card No. _____ Exp. Date _____

Signature _____

Mr./Mrs./Ms. _____ (please print full name)

School/Institution _____

Address _____

City/State/Zip _____

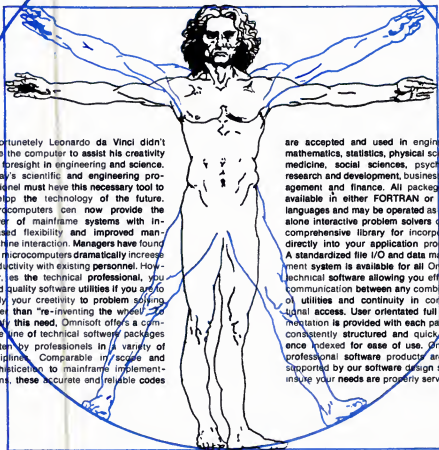
*Outside USA add \$3.00 shipping and handling. Shipped airmail only

☐ Check here to receive FREE catalog of computing books, magazines and guides

For faster service, PHONE TOLL FREE: 800-431-8112.
(In NJ only: 201-840-0445.)

Also available at your local bookstore or computer store

Omnisoft Brings Mainframe Power To The PC!



Unfortunately Leonardo da Vinci didn't have the computer to assist his creativity and foresight in engineering and science. Today's scientific and engineering professional must have this necessary tool to develop the technology of the future. Microcomputers can now provide the power of mainframe systems with increased flexibility and improved man-machine interaction. Managers have found that microcomputers dramatically increase productivity with existing personnel. However, as the technical professional, you need quality software utilities if you are to apply your creativity to problem solving rather than "re-inventing the wheel." To satisfy this need, Omnisoft offers a complete line of technical software packages written by professionals in a variety of disciplines. Comparable in scope and sophistication to mainframe implementations, these accurate and reliable codes

are accepted and used in engineering, mathematics, statistics, physical sciences, medicine, social sciences, psychology, research and development, business management and finance. All packages are available in either FORTRAN or Pascal languages and may be operated as stand-alone interactive problem solvers or as a comprehensive library for incorporation directly into your application programs. A standardized file I/O and data management system is available for all Omnisoft technical software allowing you effortless communication between any combination of utilities and continuity in computational access. User orientated full documentation is provided with each package, consistently structured and quick reference indexed for ease of use. Omnisoft professional software products are fully supported by our software design staff to insure your needs are properly served.

**Numerical methods • Statistical analysis • Engineering and Business Graphics
Control Systems Analysis and Design • Dynamic Systems Modeling and Analysis
Structural Analysis and Design • Thermodynamics • Heat Transfer
Fluid Mechanics • Optics • Mechanical, Civil, Chemical, Electrical Engineering**

Omnisoft is constantly developing new software tools for the technical professional. Write today for detailed descriptions of Omnisoft technical software products and services.



OMNISOFT CORPORATION

9960 Owensmouth Avenue, Suite 32
Chatsworth, CA 91311 • (213) 709-4900
Dept. L33

nically fulfills two MicroPro marketing concerns: covering the commands and menus needed to get a first-timer up and running, and proving WordStar won't bite. MicroPro also is bringing out Feor-

If you have more than one type of computer, you only have to buy one WordStar cassette tutorial.

Not, a quickie, upbeat, disk-based introduction to computers for the uninitiated, and is completing a videocassette WordStar tutorial. Both WordTutor's first lesson and Feornot each take up 50K RAM.

PC tested all three tutorials on the IBM PC, the PC-XT, the PC-AT with the IBM color monitor, and the Compaq. All ran fine. CDex runs in color, but not on every screenful. This was done intentionally to avoid overpowering the learning concepts, a CDEX spokesman said.

Cassette Tutorials

If you have more than one type of computer, say an IBM PC and an Osborne, you only have to buy one WordStar cassette tutorial, since none of them are computer-specific. Some people may like the sound of a human voice guiding them through WordStar, though, in all cases, the voice will be male.

Of the two cassette companies, FlipTrack has only a half dozen tutorials on the market, while Micro Instructional has about 75. Here, it's a case of the better wine coming from the smaller vineyard.

FlipTrack offers a set of three tapes covering WordStar and a fourth on MailMerge. The entire package is marketed under the name *How to Use WordStar & MailMerge*. Each runs from 50 to 53 minutes on the front sides and for almost that long on the flip sides. When the going gets tough, there's further instruction on the back sides—(flip the tape over, set the counter to 0, listen to the extra material,

continued

How WordStar Works

A "what you see is what you get" word processing program.

WordStar is a "what you see is what you get" word processor. What comes out of the printer is a replica of what's on the screen. You can see all but three or four lines of a page of double-spaced work on your screen.

Every alphabet key does double duty. Striking the Ctrl key and another key simultaneously moves the cursor around, calls up helpful screens of information, reformats the screen display, moves type, and tells the printer what to do.

A diamond pattern of keys on the left side (copied by many other programs) moves the cursor around the screen:

	W	E	R
A	S	D	F
Z	X	C	

To go up, press Ctrl-E. To go left, press Ctrl-S, etc. The other keys on the left side move words, lines, or entire screens left-right or up-down. They're geographically assigned: on the top row, W, E, and R, when pressed simultaneously with the Ctrl key, all move you higher up in the document.

continued

How to teach your kids about the IBM PC.

Computers for Kids teaches children age 8 and older to write their own programs in less than an hour—without the necessity for previous knowledge of algebra, variables, or computers. And there's a special section that keeps parents and teachers on the same successful command path.

Starting off with an easy-to-understand explanation of how to use the

IBM PC, your kids will progress quickly to flow charts and simple print programs...to loops, graphics, and other programming concepts that show the young user how to make the PC do exactly what he wants—in non-technical language that makes life easier for both of you.

So do your children a favor. Do yourself a favor. Order the PC edition of *Computers for Kids* today!

Creative Computing Press

Dept. NC&C, 36 East Hanover Ave., Morris Plains, NJ 07950

Send me _____ Computers for Kids, PC edition, at \$9.95 plus \$1.50 postage and handling each. #12K

☐ **PAYMENT ENCLOSED** \$_____. Residents of CA, NJ and NY State add applicable sales tax. Outside USA add \$3.00 per order.

☐ **CHARGE MY:** (Charge and phone order \$10 minimum)
☐ American Express ☐ MasterCard ☐ Visa

Card No. _____ Exp. Date _____

Signature _____

Mr./Mrs./Ms. _____ (please print full name)

Address _____ Apt. _____

City/State/Zip _____

☐ Send me a FREE Creative Computing Catalog.

rewind the tape to 0 so you're back where you left off, flip the tape to the front side)—hence the name FlipTrack. Nothing on the back is absolutely essential to using WordStar, but it's either extra for experts or help for the confused. For instance, it offers a debugging session for

the first time a document is printed out, and it gives you its thoughts on what might have happened if the printer didn't put out what the screen showed. FlipTrack says it has a patent on the concept.

FlipTrack's tapes are especially good

for the computer novice, who may be coming over from an old typewriter. It reminds you to touch the keys lightly so as not to trigger auto-repeat, not to confuse the lowercase letter l with the number one, and how to shut the computer down (pull the diskettes before the plug) if you want to

The rest of the Ctrl key functions are, for the most part, assigned randomly. Don't look for a logical pattern of placement.

Because there are some 165 WordStar commands (about 20 are necessary to get started with WordStar—the rest are used for default settings) and just 26 alphabet keys, most commands are two characters. For instance, to get WordStar to print in boldface type, press Ctrl-PB (one case where WordStar and you would actually think of the same letters: Print Bold). If you know the first part of the sequence (Ctrl-P), but forget the second, type in Ctrl-P and WordStar will replace the main

editing menu with a print commands menu. Find the letter you want, strike a key, and the menu disappears until needed again.

The commands are divided between the main menu (normally on), and menus for printer enhancements (Ctrl-P), on-screen formatting (Ctrl-O), moving/adjusting blocks of type (Ctrl-K), help (Ctrl-J), and quick-movement (Ctrl-Q) commands. The divisions aren't entirely obvious. For instance, is right justification an on-screen command because type shows up justified on the monitor, or is it a print command because you want to print out justified type? (Answer: it's an on-screen com-

mand.) There also are dot commands that are typed at the beginning of the document and determine the format of the printout. (Unlike the other commands, the dot command menus do not come up when you strike a Ctrl-period and forget the rest.) Dot commands are thorough. Some word processors don't even include superscripts, while a WordStar dot command lets the user increment the height of the superscript in 1/48ths of an inch.

The IBM PC version of WordStar has ten function keys, which supplement some of the most commonly used commands (or at least what MicroPro thinks are the ten most common), and cursor con-

Managing the proliferation of disks has just become a lot easier with PC/CMS



PC/CMS is a fast and efficient catalog management system that maintains a master catalog index of all files created within your system, thus relieving you of the mundane task of tracking and locating files by the old fashioned trial and error method. PC/CMS, unlike most other catalog systems, has been designed to expand its capacity along with you, thus conserving valuable time and resources.

Some of the features of PC/CMS are:

- ☐ MENU DRIVEN AND USER FRIENDLY ☐ DYNAMIC FILE AND MEMORY ALLOCATION
- ☐ AUTOMATIC CATALOG ENTRY ☐ APPLICATION INTERFACES ENABLING DYNAMIC FILE SEARCHING ☐ COLOR AND FUNCTION KEY SUPPORT ☐ HARDCOPY PRINT UTILITY
- ☐ WILD CARD SEARCHES ☐ MAINTAINS AND TRACKS ALL PERTINENT DIRECTORY INFORMATION SUCH AS:
 - Volume Identification • Date and Time Stamp Information • File Size and Sector Address Information • File Type (i.e., Single or Dual Sided, etc.) • File Status (i.e., Hidden, System, Program, Data, etc.)

PC/CMS is a bargain at only \$50.00 and will pay for itself many times over as your needs grow. It can be purchased from your local IBM PC dealer or can be ordered directly by sending a check or money order to:

TECHNOLOGY
SYSTEMS
ORGANIZATION
INC.

TSO

1590 S. DEER CROSSING DRIVE • DIAMOND BAR, CALIFORNIA 91765

Dealer inquiries invited. Visa and Mastercard orders may telephone direct at (714) 861-3263. California residents please add sales tax.

PC/CMS requires an IBM® PC with 80K, DOS 1.1, color or monochrome monitor and disk drive.

IBM is a registered trademark of International Business Machines.

CIRCLE 417 ON READER SERVICE CARD

take a break from the instruction. The sound quality is good, words are clearly enunciated, the speaker recaps each segment, and there are short beeps and musical jingles separating topics. A 71-page reference manual corresponds to the tape
continued

trol keys (the numeric keypad), which duplicate the ESDX cursor control diamond. The newest WordStor 3.3 allows reprogramming and function keys, as well as resetting the defaults if the user doesn't like the factory settings.

WordStor allows printing and writing at the same time. Document length is limited only by disk storage. There's a non-document mode to write programs. Many nonMicroPro products work with WordStor, such as dBase II.

Because WordStor is so powerful, it's easier to describe what it can't do. Bold-faced, underlined, and super/subscripted words don't show up that way on-screen, an exception to the "get-what-you-see" rule; the method of turning them on and off guarantees you'll occasionally underline every part of the document except the part you want. There's no split screen to compare two documents. You can't jump directly to a specific page, paragraph, or sentence. It won't add up columns of numbers or automatically place footnotes, although there are nonMicroPro programs that you can bolt to WordStor to do these tasks.

WordStor can't quickly dump a short memo to the printer without a save and print sequence—the PC's Shift-PrintSc command prints the WordStor status line and editing menu as well as the memo. It can't run some budget printers, nor can one WordStor program run two printers. It can microjustify by inserting slivers of space between letters, not just words, to give a fair approximation of justified typeset material. Though WordStor can print multiple columns, useful for a newsletter, it can't microjustify multiple columns.

Still, no word processing program is perfect. To many serious users, WordStor is the least imperfect, and, at the advanced age of 4-1/2 years, still king of the heavy-weights.
—B.H.

Do you want the #1 Seller or the #1 Financial System?

FEATURES	The Home Accountant	The ACCOUNTANT Finance Data Base System
Transactions Per Disk	1000	63
Number of Codes	1	900
Automatic Transactions	25	Unlimited
Number of Transactions	Once a month	YES
Number of Transactions	NO	NO
Double Entry	NO	YES
Accounting Background Required	NO	Screen at a time
Accommodates Any Type Transaction	One at a time	YES
Transaction Retrieval	NO	ALWAYS
Back-up Transactions	SOMETIMES	NO
Ability to Insertion Write Printing	YES	252,801.42
119 COL. PRINTER REQUIRED	232,013	NO
NUMERIC FORMATTING	NO	YES
Original Visual Interface	115 sec	44 sec
PERFORMANCE		
Startup to Transaction Entry	102 sec	1 sec
Begin Printing Balance	106 sec	2 sec
Screen After Entering Transactions		
Begin Printing		
Transactions After Entering Transactions		
RATING		
Feelings & evaluation	B D	A
PRICE		
Apple II - Personal Version	\$75	\$129
IBM PC - Personal Version	\$150	\$195
Apple II - The Business ACCOUNTANT™	—	\$255
IBM PC - The Business ACCOUNTANT™	—	\$285

MONEY MAGAZINE - Nov. 1982

"Among bookkeeping programs, earns high marks and is easy to use"

CREATIVE COMPUTING - Jan. 1983

"The documentation is thorough, easily read, and complete"

"The program is so easy to use that rarely will reference have to be made to the manual"

SOFTALK - Jan. 1982

"For the home user (and perhaps even the small business), the best package we evaluated was The ACCOUNTANT by Decision Support Software"

"The ACCOUNTANT does a good job of making financial management a simple and straightforward task"

INFOWORLD - Jan. 3/10, 1983

"Complete flexible financial data base package for the home user"

"... exceptionally fast ... highly recommend"

The ACCOUNTANT Finance Data Base System™

Decision Support Software Inc.

1438 Ironwood Drive, McLean, VA 22101 • (703) 241-8316 • Orders Only: (800) 368-2022

Apple II, IBM PC, VisiCalc™, The Home Accountant™ are trademarks of Apple, IBM, VisiCorp, and Commenal Software respectively.

CIRCLE 212 ON READER SERVICE CARD

PC MAGAZINE 255 NOVEMBER 1983

and can be used on its own, too.

The FlipTrack tapes are generic, with no specific mention of the IBM PC or its function keys, but there are points where you are encouraged to experiment with your keyboard. For instance, you are asked to see if your keyboard has an insert key, which could be used instead of WordStar's Ctrl-V insert function. ("That's 'V' as in 'Victor,'" the announcer says, "and don't try to look for any [mnemonic] meaning in that.")

The Micro Instructional tapes, WordStar General (introductory), WordStar-IBM PC, and Advanced WordStar, can be bought separately. They run 72, 73, and 68 minutes, respectively. The PC tape is the general tape with a 30-second tour of the PC's function keys inserted. (Advanced WordStar is about MailMerge.)

Overall, the Micro Instructional tapes aren't in the same league with FlipTrack. There's a bad recording that occurs early in the general tape, the sound quality is mediocre (Ctrl-B, -D, -V, -P and -T are difficult to distinguish), topics aren't separat-



WordStar has given rise to a myriad of training aids to help you teach yourself.

ed by silence or music, and MI teaches some strange WordStar concepts.

For instance, MI says dot commands (printer format commands that start with a period) should be typed with capital letters and a space before the number. In fact,

WordStar is happy with upper or lowercase, space or no space. The user is instructed to format a letter with the page-length command .PL 66 (66 one-sixth inch lines, or 11 inches), with no mention that .PL 66 is an automatic default of

Photograph: Michael Gordon, PC; courtesy of Compuserve and West Springfield, Massachusetts.

WHY YOU NEED COPY II PC:

1. COPY II PC allows you to backup your valuable software. And unlike other backup programs, COPY II PC will exactly duplicate most software - never modifying the information on either the original or duplicate disk. This assures maximum reliability and compatibility with the widest range of disk formats. COPY II PC can even duplicate disks made for other computers such as Hewlett Packard, Kaypro, Morrow, Nec, Osborne, Otrona, Superbrain, Televideo, Xerox and Zenith, all on your IBM PC!

2. COPY II PC is a complete replacement for "DISKCOPY" on your PC-DOS diskette. It formats, copies, then verifies the duplicate disk (DISKCOPY does not verify). COPY II PC automatically uses all the memory in your PC, and adjusts for single/dual sided diskettes. A drive speed utility helps keep your drives in top condition, and a bulk erase program allows you to remove all information (including formatting) from a diskette.

For your convenience, COPY II PC is not copy-protected.
Available at fine computer and software stores or direct from:

CENTRAL POINT
Software, Inc.

P.O. Box 19730-203
Portland, OR 97219
(503) 244-5782

\$39⁹⁵
(Plus \$2 a/h)

Attention Apple owners: Call us about backing up your valuable software with Copy II Plus!

CIRCLE 131 ON READER SERVICE CARD

PC MAGAZINE 256 NOVEMBER 1983

1,2,3™ - dBASE II® - Multiplan™ - VisiCalc® - Contact MBA™ - SuperCalc2™ - Data Base Manager II - Calcstar - VisiFile™ - Friday-DataStar™ - The Strategist - EasyFiler™ - ReportStar - Perfect Filer™ - PerfectCalc™ - pfs:file - pfs:report - UltraFile - Business Planning Tool - T IM III™ - Data Design - File Manager - Data Reporter - Easy Planner - Bottom Line Strategist™ - Database Manager™ - T.K.'s Solver™ - Btrieve™ - QBASE - Financial Modeling™ - Supercalc™ - ACCELERATOR™ - DataKeep™ - EagleCalc - LisaCalc - DBPlus Database - LogiCalc - ProCalc - HDBS - MDBS - FMS-80 - FMS-81 - Superfile - Condor I - Condor III - EasyPlanner™ - Target Financial Modeling™ - Datafax - KnowledgeMan™

These Products Give You

You've probably heard of, or are using, at least one of these products. The products are generally good and can handle various business needs. Until now, you have been confined to the functions that these systems deliver.

Introducing Number Cruncher™ THE BUSINESS PRODUCTIVITY SYSTEM

Number Cruncher gives you:



1. **DataBase Management**

2. **Information Management**

3. **Text Editing**

4. **Applications Generation**

5. **Spreadsheet**

The list of applications that the Number Cruncher can be used for is endless. Through its features, you can design your own applications, without the need of a programmer. Programmers will become a thing of the past, at least as far as your personal computer is concerned! Now your computer can do what you always heard it would do. Create Mail List, Inventory, Invoicing, any application that you require... quickly and easily. OR — You can buy your complete application from Pyramid for under \$90.00. Create them yourself, or purchase them at a minimal price, either way your applications are finally within easy reach. Number Cruncher gives you more! DataBase Management, Information Management, Text Editing, Applications Generation, and Spreadsheet, all in one completely integrated package. The Business Productivity System, available for \$395.00. At this price, you can't afford to miss out.

Call us on our toll free hotline, (800) 521-2233 (In California (714) 639-1527 - Collect), and we'll arrange a demonstration of the most powerful software package to date!

PYRAMID
PYRAMID DATA

PYRAMID DATA, LTD. - P.O. BOX 10116 - SANTA ANA, CA 92711 - (800) 521-2233 (In Calif. (714) 639-1527)
OFFICES NATIONALLY

COPYRIGHT © 1983 PYRAMID DATA, LTD., ORANGE, CA

CIRCLE 410 ON READER SERVICE CARD

*Our PasswordTM
Modem's
sophisticated
new
control panel*

**THE BUSIER YOU ARE,
THE BETTER YOU LIKE IT.**

PASSWORDTM is a modem so efficient and convenient there is little to do but turn it on to transmit at 300/1200 baud. Operating features include auto dial/answer, auto mode/speed select, full/half duplex. PASSWORD has all this, plus a two-year limited warranty, at a price of just \$449.*

TELPATM telecommunications software (optional) programs PASSWORD to transfer files, in terminal or host mode, with multiple error checks. Phone directory gives choice of timed dial and logon. Command mode includes file display and update, menus and help, and much more. Write or call for complete specifications.

*Suggested list for PASSWORD complete with power, phone, RS232 interface cables. TELPAC software optional extra, \$79.

PASSWORD, TELPAC, USR logo and U. S. Robotics are trademarks of U. S. Robotics Inc.



U. S. ROBOTICS INC.
1123 WEST WASHINGTON
CHICAGO, ILLINOIS 60607
(312) 733-0497

CIRCLE 446 ON READER SERVICE CARD

WordStar. One form letter that supposedly will be used to teach MailMerge is created using WordStar's nondocument mode even though it's a document—and a few minutes later, it's abruptly abandoned.

MI was founded by an exterminator; it's ironic the WordStar tapes should have so many bugs. Micro Instructional must be doing something right, though, since it's sold thousands of tapes to Xerox and Kay-Pro to give to their customers. Perhaps the WordStar tapes don't represent MI's best effort.

The company is preparing a new tape integrating the PC functions throughout the tape. A prereleased copy of the revised tape had better sound quality, better divisions between topics than other Micro Instructional WordStar tapes, and adequate mention of the special IBM PC keys.

Templates

Templates can be handy memory-jog-
continued

Product Information

Production information for the WordStar training guides mentioned in the article and for those soon to be released.

Books

WordStar Mode Easy, second edition

Walter A. Ettlin
(Osborne/McGraw Hill,
Berkeley, CA, 1982)

164 pages; \$11.95

CIRCLE 575 ON READER SERVICE CARD

Introduction to WordStar, second revised edition

Arthur Naiman
(Sybex, Berkeley, CA, 1983)

202 pages; \$8.95

Practical WordStar Uses,

Julie Anne Arca
(Sybex, Berkeley, CA, 1983)

200 pages; \$13.95

CIRCLE 574 ON READER SERVICE CARD

The Illustrated CP/M WordStar Dictionary

Russel A. Stultz
(Prentice-Hall, Englewood Cliffs, NJ,
1983)

258 pages; \$14.95

CIRCLE 573 ON READER SERVICE CARD

continued

NumberCruncher™

THE BUSINESS PRODUCTIVITY SYSTEM

"The best part of the Number Cruncher is that it is so easy to use."

PC Magazine - August 1983

"It (Number Cruncher) will have had impact, created changes, and started a new trend in program design."

PC Magazine - August 1983

For a copy of our unique Pyramid Disk Poster, Call Pyramid

PYRAMID DATA, LTD. - (800) 521-2233 (In California (714) 639-1527

PYRAMID™
PYRAMID DATA

Copyright © by Pyramid Data, Ltd., Orange, CA

CIRCLE 519 ON READER SERVICE CARD
PC MAGAZINE 259 NOVEMBER 1983

WORDS CAN'T DESCRIBE THE EASE OF USING TRANSEND PC FOR ELECTRONIC MAIL.



SCREENS CAN.

The screens say so much, you may never need the manual. Transend PC turns your IBM PC into an electronic workstation or an intelligent terminal. Four screens show how easy it is to use:

1. Transend PC uses IN and OUT baskets just like you do. To choose one, hit a key.

2. The basket shows what's inside. To choose a document, hit a key and voila!

3. It's full size. You can read, edit, file, address or toss it (Note the WASTE basket on screen 1).

4. To route or address a document, pick a name from the ADDRESS basket. Transend PC does the rest.

To mail it over the phone, move it to the OUT basket and hit another key. Transend PC dials the addresses; delivers (through SOURCE-MAIL™, OnTyme®, or direct to another PC); checks for incoming mail; and signs off. You don't have to set up anything or learn any parameters.

Transend does everything automatically.

Transend PC works with all other software packages like 1-2-3™, WordStar®, and VisiCalc®. You can label baskets to handle all your paperwork. And Transend PC lets your IBM PC talk to any other computer.

For a closer look at the screens, ask your dealer for a demo. For a closer look at electronic communications, ask for a free copy of *The Who, What, Why, How and When of Electronic Communications* from Transend.

Transend Corporation
2190 Paragon Drive
San Jose, CA 95131
(408) 946-7400

Transend PC is a trademark of Transend Corporation. IBM PC is a registered trademark of International Business Machines Corporation. SOURCE-MAIL is a service mark of The Source Intercomputing Corporation, a subsidiary of The Source Computer Associates Corporation. OnTyme is a registered trademark of OnTyme, Inc. 1-2-3 is a registered trademark of Lotus Development Corporation. WordStar is a registered trademark of MicroPro Inc. VisiCalc is a registered trademark of VisiCorp.

TRANSEND

THE WORLD JUST KEEPS GETTING SMALLER.

gers but, alone, are not enough to teach WordStor. Three templates fit around the PC keyboard and provide ready reference to WordStor and MailMerge commands.

The \$20 Kleertex template puts all the commands on one side. The back side has VisiColc or SuperColc templates (\$13 extra) or is ruled for the do-it-yourselfer. The \$15 PC-DocuMate splits WordStor commands over two sides.

Choosing between the two is tough. Having the commands on one side is easier for the user (advantage Kleertex), while two sides allows for larger type, slightly longer explanations of the dot commands and their default values, and a few extra commands, such as search and replace options (advantage PC-DocuMate). The Kleertex seems slightly better organized while the PC-DocuMate's reverse-type subject headings (black on white) are easier to locate. The Kleertex comes in a cardboard carton; the PC-DocuMate in a foam-board-stiffened envelope that is somewhat resistant to bending by Postal Service

continued

Pocket Guide to WordStor

Anthony Bove and Cheryl Rhodes
(Addison-Wesley, Reading, MA, 1983)
96 pages; \$7.25

CIRCLE 572 ON READER SERVICE CARD

Using the IBM Personal Computer: WordStor

C.J. Puotinen
(CBS Educational & Professional Publishing, New York, 1983)

357 pages; \$16.95, \$39.95 with diskette

The Last Word on WordStor

C.J. Puotinen
(CBS Educational & Professional Publishing, New York, 1983)

317 pages; \$16.95, \$39.95 with diskette

CIRCLE 571 ON READER SERVICE CARD

WordStor 3.3 Reference Manual, WordStor 3.3 Training Guide, WordStor 3.3 Installation Manual
StorIndex 1.0 Reference Manual, Mail-

Merge 3.3 Reference Manual, SpellStor 3.3 Reference Manual
(MicroPro International Corp., San Rafael, CA, 1983)

Manuals supplied with programs. WordStor (\$495), MailMerge (\$250), SpellStor (\$250), or with updates (\$85, \$25, \$25, respectively, or free if previous version bought after April 1, 1983)

CIRCLE 570 ON READER SERVICE CARD

Disk Tutorials

ATI WordStor Menu Power Vol. I
ATI WordStor Command Power Vol. II
Software Training/Division of American Training Institute (ATI)
3770 Highland Ave.
Suite 201
Manhattan Beach, CA 90266
(213) 546-5579

List Price: \$75 for both (\$2.50 shipping)
Requires: two disk drives, 64K RAM, PC-DOS

CIRCLE 569 ON READER SERVICE CARD

continued

NumberCruncher™

THE BUSINESS PRODUCTIVITY SYSTEM

"My mind kept telling me that the process of the Number Cruncher couldn't be as simple as it seemed — it turned out it really is."

PC Magazine - August 1983

"The Number Cruncher offers small businesses a complete package that is priced right."

PC Magazine - August 1983

PYRAMID™
PYRAMID DATA

For a copy of our unique Pyramid Disk Poster, Call Pyramid
PYRAMID DATA, LTD. - (800) 521-2233 (In California (714) 639-1527

Copyright © by Pyramid Data, Ltd., Orange, CA

CIRCLE 520 ON READER SERVICE CARD
PC MAGAZINE 261 NOVEMBER 1983

programmer s

READ THIS...

NOW, I KNOW I CAN MAKE BIG MONEY WRITING AND SELLING MY PROGRAMS. THIS BOOK TOLD ME WHAT TO WRITE — WHO TO SELL IT TO — THOUSANDS OF NAMES, ADDRESSES, IDEAS, GUIDELINES. THE "SOFTWARE WRITER'S MARKET" IS A FANTASTIC BOOK!



- * WHO TO SELL YOUR PROGRAMS TO
- * THOUSANDS OF COMPANY NAMES AND ADDRESSES, WITH DETAILED LISTINGS SHOWING:
 - (1) WHAT PROGRAMS PUBLISHERS ARE LOOKING FOR
 - (2) HOW THEY WANT YOU TO SUBMIT YOUR PROGRAM
 - (3) HOW MUCH THEY PAY — AND WHEN!
- * 100 CATEGORIES — FROM "ACCOUNTS RECEIVABLE" TO "GAMES" TO "VIDEO CONTROL" PROGRAMS
- * HOW TO WRITE CLEAR DOCUMENTATION
- * DEBUGGING TECHNIQUES

Enclose check or money order
for \$19.95 (No C.O.D.'s) to:

IPF Publications
146-E Country Club Lane
Pomona, NY 10970
(914) 354-5585

Order Your Copy Today!

Name

Address

City..... State..... Zip.....

gorilla types but not always resistant enough.

Both templates group commands differently from the other and from the way WordStor does. Though there may be educationally sound reasons for the difference in groupings, the variation may confuse novices.

For the PC user on a budget, check out
continued

CDex WordStor Training Program

Cdex Corporation
5050 El Camino Real
Los Altos, CA 94022
(415) 964-7600

List Price: \$69.95

Requires: one disk drive, 64K RAM

CIRCLE 566 ON READER SERVICE CARD

WordTutor

MicroPro International Corporation
33 San Pablo Ave.
San Rafael, CA 94903
(415) 499-1200

List Price: TBA, or supplied with WordStor 3.3

Requires: 64K RAM, one disk drive, PC-DOS

CIRCLE 567 ON READER SERVICE CARD

Cassette Tape Tutorials

How to Use WordStor

How to Use WordStor & MailMerge
FlipTrack Learning Systems
526 North Main St.
Box 711
Glen Ellyn, IL 60137
(312) 790-1117

List Price: \$49.95 for three WordStor tapes, \$65 for MailMerge tape and same three WordStor tapes.

Requires: Cassette recorder, preferably with counter

CIRCLE 568 ON READER SERVICE CARD

WordStor General Instructional tape
WordStor-IBM PC Instructional tape
Advanced WordStor Instructional tape
Micro Instructional Inc.
6299 W. Sunrise
Fort Lauderdale, FL 33313
(305) 584-3133

List Price: \$29.95 each

Requires: Cassette recorder

CIRCLE 569 ON READER SERVICE CARD

continued

Cross Clues™ The unique word challenge game.

It offers intellectual stimulation arcade games can't match... with all the excitement.

Fast-action fun isn't just for mystery or arcade games any more. *Cross Clues* is a word game that tests more than mere reflexes. It's the mind-challenging evolution of the crossword puzzle, with beat-the-clock excitement. The playing tempo is lively, but you decide how fast you want to go. The computer "umpires" while you compete with another player for hidden words, coaxing clues from the computer. Since a clue helps your opponent too, suspense builds till the end, when the best combination of skill, intellect, timing and luck wins.

If you're ready for an even greater challenge, try *Concentration Crosswords*™, a game that offers 3 levels of difficulty and 3 ways to play—for even the most demanding word whiz. Again, you compete against the clock to uncover hidden words. But once discovered, they disappear, to test your memory. Here, a combination of word skills, intellect, memory and luck determine the winner.

Both games offer 50 mind-boggling puzzles that appeal to young teens through adults. Try them both!

To obtain these word games, see your local dealer.

Or send in the convenient order form below.

Compatible with Apple II,* 48k disk, and IBM Personal Computer, 64k, disk drive (DOS 1.1).

For faster service, call Toll Free 800/621-0476.

In Alaska, Hawaii or Illinois, call 312/984-7000.

S R A *SCIENCE RESEARCH ASSOCIATES, INC.
155 N. Wacker Dr., Chicago, IL 60606
A Subsidiary of IBM

Apple II is a registered trademark of Apple Computer Inc.

Yes! Please send me these Exciting games today!

Quantity

☐ Cross Clues \$40.00*

☐ for Apple 88-3500 ☐ for IBM 88-3510

☐ Concentration Crosswords \$40.00*

☐ for Apple 88-3508 ☐ for IBM 88-3520

Check method of payment:

☐ VISA # _____ Exp. Date _____

☐ Mastercard # _____ Exp. Date _____

Name _____

Street _____

City _____ State _____ Zip _____

Signature _____

*Plus shipping, handling, and local taxes, if applicable.

Mail to: SRA, Software Products Dept., 155 North Wacker Drive, Chicago, Illinois 60606

CIRCLE 582 ON READER SERVICE CARD

ANNOUNCING THE MASTER DIRECTORY— THE COMPLETE GUIDE FOR YOUR IBM PC OR XT

**Over 500 pages
of listings for
IBM-compatible
hardware,
software,
accessories and
services—from
the publishers of
PC Magazine...**

There are literally thousands of different products on the market that are compatible with your IBM PC or XT. And new ones are being introduced every day.

How do you find the ones you need? How do you decide which ones are best for you?

With PC Buyers Guide.

Thousands of products in one convenient source.

The publishers of PC Magazine have organized the myriad of IBM-compatible products, services and support items into one comprehensive, easy-to-use guide. It's the quickest and most reliable way to put your finger on exactly what you need to enhance the usefulness of your computer.

Every product in the directory is fully and accurately described. You'll find out what it is, what it does, how much it costs, and where to get more information about it. You'll know what level of skill is required—novice, intermediate or technical. And everything is cross-referenced so you won't miss a thing!

Get more from your PC or XT

The documentation you received from IBM is only the beginning. Finding the right software and hardware is what really makes the difference in how effectively you



IBM PC or XT performs. That's why this kind of complete product information is indispensable.

And in addition to thoroughly covering hardware and software, PC Buyers Guide includes details on all the important extras:

- Accessories
- Supplies
- Furniture
- Books
- Periodicals
- Consultants
- Maintenance and Support
- User Groups
- Bulletin Boards
- Professional Societies

The more complete your knowledge is about what's available for your PC, the more sophisticated a user you'll become.

And the more you'll get from your computer.

Order your copy today

Demand for PC Buyers Guide is great, so be sure to order your copy now. Simply fill in the coupon below and mail it today.

MAIL TO:
PC BUYERS GUIDE
CN 1914 Morristown, NJ 07960

Please send me _____ copy(ies) of PC: The Product Directory. I enclose \$7.95* for each copy, plus \$1.50 for postage and handling.

Outside the U.S.A., the price is \$10.00; send U.S. funds only. *Residents of CA, CO, CT, DC, FL, IL, MA, MI, MD, NJ, NY State and VT add applicable sales tax.

Name _____
(please print)

Address _____

City _____

State _____ Zip _____

the WordStor Keyboard Primer, which costs 75 cents. (When was the last time a computer accessory set you back 75 cents?) Also look into the companion Function Key Template by V&P Business Systems, a Boston-area word processing company that sells these as a sideline. The Primer is a 2-by-15 inch strip of bristol, which can be taped to the keyboard, monitor, or wherever you want it, and which covers all WordStor and MailMerge commands. The template lists the WordStor function keys. It's also available blank — just the thing, now that function keys are readily redefined. The only drawback to the V&P Primer is the small type size — it's a bit hard on the eyes.

All three templates are for WordStor 3.24; versions for 3.3 should be on line by

continued

Keyboard Templates

PC-DocuMate WS-100 keyboard template for WordStor 3.24.

Systems Management Associates
Box 20025
3700 Computer Dr.
Raleigh, NC 27619
(919) 787-7703

List Price: \$14.95

Requires: IBM PC keyboard or Keytronic/
IBM PC-type keyboard (15-1/2 x 4-1/4)

CIRCLE 564 ON READER SERVICE CARD

Kleertex WordStor Keyboard Template

Creative Computer Products
Box 85152, MB134
San Diego, CA 92138
(619) 268-0793

List Price: \$19.95 WordStor (blank, ruled back side), \$32.95 WordStor backed by SuperColc or VisiColc (\$1.95 shipping)

Requires: IBM PC or Keytronic/IBM PC-type keyboard

CIRCLE 563 ON READER SERVICE CARD

WordStor Keyboard Primer

WordStor Function Key Template

Blank Function Key Template

V&P Business Systems Services
Box 1332
Dedham, MA 02026
(617) 323-8026

List Price: primer, \$.75 each (\$.50 shipping). Template, \$.50 each (\$.50 shipping each 1-10 templates)

CIRCLE 562 ON READER SERVICE CARD



Free Enterprise™ A business management game

You run your own company making decisions based on economic factors and the actions of competitors.

It's your opportunity to sit on top and run a corporation. *Free Enterprise*, based on an IBM-developed simulation for training top-level managers, is as surprising and demanding as the real world.

It lets you face the same on-your-toes challenges you would in running a real business: pricing products, determining budgets for advertising, production, plant improvement, and R&D. Even securing bank loans and deciding on stockholder dividends. You use computer generated reports to make decisions. But if you're wrong you could go bankrupt. Only the shrewd survive!

Free Enterprise can be played at three competency levels so novices can compete with the more experienced, and from one to six can play. It's the perfect chance to learn about the free enterprise system — to practice business strategies — and to enjoy it — with no risks.

Simulation components: disk, user's manual, pad of 50 record sheets, and pad of 50 decision sheets.

To obtain *Free Enterprise*, see your local dealer or send in the order form below.

Operates on an IBM Personal Computer with 64k RAM and disk drive (DOS 1.1) or an Apple II Plus with 48k RAM and disk drive (DOS 3.3). A printer is strongly recommended.

For faster service, call Toll Free 800/621-0476. In Alaska, Hawaii or Illinois, call 312/984-7000.

S R A® SCIENCE RESEARCH ASSOCIATES, INC.
155 N. Wacker Dr., Chicago, IL 60606

A Subsidiary of IBM

Apple II Plus is a registered trademark of Apple Computer Inc.

Yes! Please send me *Free Enterprise* today.
Quantity _____

_____ Free Enterprise \$100.00† each

☐ for Apple 88-31600 ☐ for IBM 88-31610

Check method of payment:

☐ VISA # _____ Exp. Date _____

☐ Mastercard # _____ Exp. Date _____

Name _____

Street _____

City _____ State _____ Zip _____

Signature _____

†Plus shipping, handling, and local taxes, if applicable.

Mail to: SRA, Software Products Dept., 155 North Wacker Drive, Chicago, Illinois 60606

CIRCLE 583 ON READER SERVICE CARD

DIAMOND DELIVERS!

The Total Solution This Months Packaged Specials

WORDSTAR/LOTUS 123	\$569
dBASE II/QUICKCODE	\$589
MULTITOOL WORD W/MOUSE	\$329
WORDSTAR/MAILMERGE/ SPELLSTAR/STAR INDEX	\$379
WORDSTAR PROFESSIONAL PACK/LOTUS 123	\$699
WORDSTAR/dBASE II	\$649
LOTUS 123/ALPHA DATABASE MANAGER II	\$489
WORDSTAR/MAILMERGE/ SPELLSTAR/STAR INDEX/ INFOSTAR	\$599
AST* 6 PACK PLUS 64K/HAYES* 1200 SMART MODEM	\$769
WORDSTAR/dBASE II/ LOTUS 123	\$979

Diamond Software is the solution for all of your IBM PC software needs. Our technical advisors keep up to date on all the latest products and applications. They are available to consult and advise you before, during and after your system purchase. And Diamond can help select systems custom made for your needs. All this and low, low prices too. Call Diamond today, you'll be glad you did.

**TO ORDER CALL TOLL-FREE 1-800-227-0545
TECHNICAL DEPARTMENT (415) 893-7678**

Diamond Software Supply 484 Lake Park Ave., Suite 123, Oakland, CA 94610

Software Specialists For The IBM PC

IBM is a registered trademark of International Business Machines.

the time you read this.

If WordStar isn't your program, every one of the companies offers training guides. Most commonly available are those for EasyWriter II, VisiCalc, SuperCalc, and MultiPlan. And some training programs are in the works for Lotus 1-2-3 and the powerful program dBase II.

It's also possible to arrange classes through a computer dealer or an outside company, especially if you're in a big city. (See "In Search Of Computer Training," PC, Volume 2 Number 3) for a comprehensive list of classroom training and do-it-yourself tutorials on disk and cassette.)

By the end of the year, look for several more WordStar training programs, including videodisks and videocassettes (make sure the manufacturers have figured out a

Upcoming WordStar Guides

WordStar Training Videocassette

Computer Labs of America
9340A Clairmont
Mesa Blvd.
San Diego, CA 92123
(619) 576-1133

List Price: \$199, or leased to training programs

Requires: Videocassette recorder

CIRCLE 561 ON READER SERVICE CARD

WordStar Training Videocassette

Micro Learning Concepts Inc.
380 Lexington Ave., Suite 1208
New York, NY 10017
(212) 687-0066

List Price: TBA

Requires: videocassette recorder

CIRCLE 560 ON READER SERVICE CARD

WordStar Training Videocassette

Bay State Productions
35 Springfield St.
Agawam, MA 01001
(413) 788-4454

List Price: TBA

Requires: Videocassette recorder

CIRCLE 559 ON READER SERVICE CARD

WordStar Training Videocassette

MicroPro International Corp.
33 San Pablo Ave.
San Rafael, CA 94903

List Price: TBA

Requires: Videocassette recorder

CIRCLE 558 ON READER SERVICE CARD

way to make 80 columns of information legible on TV sets), and updates the existing materials that reflect WordStor 3.3 and the specifics of the IBM PC keyboard.

Cdex is by far the best disk tutorial, FlitTrack's How to Use WordStor, the best cassette, and Naiman's, How to Use WordStor, the best book; but sometimes the best teacher is a personal WordStor whiz, standing over your shoulder. Whatever your choice, we hope you get the word.

/PC

Criterion Personal Learningware for WordStor (two one-hour cassette tapes, keyboard template)

TechniLogic
2634 Chapel Blvd.
Durham, NC 27707
(919) 493-4560

List Price: \$29.95 (\$1.50 shipping)

CIRCLE 557 ON READER SERVICE CARD

WordStor Tutorial Program (disk, two cassette tapes, reference cards)

InfoSound
1160 Eisenhower Place
Ann Arbor, MI 48104

List Price: TBA

Requires: cassette recorder

WordStor Training Cassette Tape

Personal Tutor Associates
ExecSystems Corp.
Box 246
Clinton, MD 20735
(301) 856-2280

List Price: \$49.95

Requires: cassette recorder

CIRCLE 556 ON READER SERVICE CARD

WordStor Disk Tutorial

Data Processing Education Corp.
5701 North High Street Suite 108
Columbus, OH 43085
(614) 888-7333

List Price: TBA

CIRCLE 555 ON READER SERVICE CARD

Teach Yourself WordStor on the IBM PC

DELTAK Microsystems Inc.
East/West Technological Center
1751 West Diehl Rd.
Naperville, IL 60566
(800) 282-5586, (312) 369-3000

List Price: TBA

CIRCLE 554 ON READER SERVICE CARD

DIAMOND DELIVERS!

dBase II	\$ call	Quadlink	\$499
Infostar	\$259	Volkswriter Dix	\$179
Multiplan	\$175	Vision	\$ call
Multitool Word	\$269	Wordstar	\$245

LIST	OUR PRICE	LIST	OUR PRICE
Alpha Software*		Microsoft*	
APPLE IBM CONNECTION	\$195	MAILMERGE	\$250
DATA BASE MANAGER II	\$205	STELLSTAR	\$250
		WORDSTAR MAILMERGE	\$645
		CALCSTAR	\$199
		STARBURST	\$199
AppSoft Software*			
VERSAFORM	\$700	Microsoft*	
Admon-Tator*	\$295	MOUSE	\$195
dBase-II		MULTITOL FINANCIAL	\$100
FRIDAY	\$650	MULTITOL BUDGET	\$150
		PASCAL COMPILER	\$350
CompuLink		FORTRAN	\$350
CONDOR 20-3	\$150	C COMPLEX	\$395
CompuLink*		PEACHTREE*	\$395
HOME ACCOUNTANT	\$400	PEACHTREE (GL. AP. AN)	\$125
Digital Research*	\$350	Software Publishing*	\$140
PASCAL WIT - 86	\$200	PPS REPORT	\$140
CONCURRENT CFIM 86	\$150	PPS FILE	
C BASIC 86	\$ 80	PPS GRAPH	\$495
PERSONAL BASIC		Software Systems*	
CFIM 86	\$350	MULTIMATE	\$195
PC DOS LANGUAGES		Supernova*	\$295
Dow Jones*		SUPERCALC	\$295
MARKET ANALYZER	\$195	SUPERCALC 2	\$425
	\$150	SUPERWRITER	\$600
Financial*		Supersoft*	\$125
PERSONAL SERIES	\$195	FORTRAN	\$375
TAX SERIES	\$295	C COMPLEX	\$275
Fox & Colson*	\$295	PERSONAL DATA BASE	\$195
QUICKCODE	\$ 99	Vision*	\$250
GORAPH		VISIWORD	\$250
GUTL	\$125	VISICALC IV	\$300
HumanSoft*		VISIFILE	
DB PLUS	\$350	VISITREND/LOT	\$275
Information Unlimited*	\$125	VISISCHEDULE	\$ call
EASYWRITER II	\$275	AST Research*	
EASYPELLER II	\$400	6 PAK PLUS-64K	\$395
EASYFLER	\$175	ALL OTHER AST PRODUCTS	\$595
EASYMAILER	\$595	Hayes*	
ACCOUNTING SERIES	\$495	SMARTMODEM 1200	\$699
Lextron*		SMARTMODEM 1200B	\$599
SPELLBINDER	\$105	Quadrant*	\$295
LifeWare*	\$125	QUADCOLOR	\$275
VOLKSWRITER		64K EXPANDABLE BOARD	\$425
VOLKSWRITER INTL	\$105	256K	
Micro Data Base Systems*	\$500		
KNOWLEDGEMAN	\$299		
Software Arts*			
TK SOLVER			

At Diamond Software we offer the widest range of business application software for your IBM PC and compatibles at the lowest possible prices. Not only that, we offer same day shipment on most items and we accept Visa, Mastercard and also American Express. We'll even pay the shipping charges if you send us a money order, cashiers, company or personal check. Purchase orders are gladly accepted from qualified organizations and we welcome dealer inquiries.

TO ORDER CALL TOLL-FREE 1-800-227-0545



Diamond Software Supply 454 Lake Park Ave., Suite 123 Oakland, CA 94610

For price quotes, information, or in California call 1-415-893-7673. We credit your order for the call. Technical Department (415) 893-7474. International Telex 338139 (a11n 1449)

Software Specialists For The IBM PC

Shipping/Handling UPS surface \$3.00 plus an additional \$3.00 per item for UPS Blue C.O.D. orders add \$4.00. For personal check allow 2 weeks for delivery. All items subject to availability, prices subject to change without notice. Calif. residents please add 6 1/2% sales tax. *IBM is a registered trademark of International Business Machines Corp. IBM is a registered trademark of Digital Research.

CIRCLE 190 ON READER SERVICE CARD

FOUND!



Accessibility.

That's the key to information management. And nothing offers greater access to information than DataFax™.

Working on DataFax is easy as typing a page. Information is entered just like pages in a regular folder. Familiar filing is the advantage.

But unlike files in a big cabinet, each folder can be labeled by up to 100 keywords, and accessed by any combination of them. A unique system of cross-referencing allows you to do extremely complex searches in seconds, through the largest databases. And with DataFax, you

can do range searches (like with dates or prices), sorting, and even use "and/or" as search criteria.

Information that is impossible to classify or fit into the strict formats of traditional database managers can now become useful, workable data. Memos, telephone numbers, business contracts, investment opportunities, bibliographies, or recipes. And access to all of your information is instant. DataFax makes powerful electronic file management incredibly useful and very understandable.

Because the very best thing about having lots of information is knowing right where to find it.

For more on our simply powerful software, dynamic sales and technical support, call us at 1-800-GET-LINK or 213-453-8921 in California. And remember to ask about our 7-Day Free Trial Program and DataFax floor display.

LINK SYSTEMS

We make simply powerful software.

DataFax runs on the Corvus Concept®, NCR Decision Mate V7, Apple II® line, Apple III®, IBM PC®, IBM XT®, COMPACT® Suggs and on hard disk systems. Each is a registered trademark of the respective manufacturer.

Hardware courtesy Computerland, W. Los Angeles, CA

© 1985 Link Systems

CIRCLE 252 ON READER SERVICE CARD

dBASE

BREAK THROUGH

dBASE is a trademark of
Ashton-Tate

Announcing

the most sophisticated database program development tools available on any personal computer anywhere.

The Database

ACCELERATOR™

Automatic program, screen, menu, report generation.
Automatically checks, formats, documents your programs.

Now available for the IBM PC at an introductory
price of \$195. 30 day money back guarantee.

from
Optimal Software

The Database Accelerator is a
trademark of Optimal Software

Distributed by Programming International
505 Hamilton Avenue, Suite 301, Palo Alto, CA 94301
(800) 222-8811 inside California: (415) 324-3730
Dealer inquiries welcome

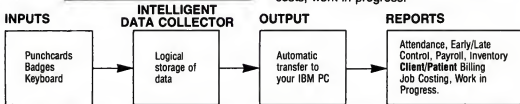
CIRCLE 322 ON READER SERVICE CARD

Your IBM® PC Can Pay You More...



Intelligent Data Collector Systems from TECH-S

are designed to simply plug into your IBM PC. The Intelligent Data Collector not only prevents losses due to inaccurate recording and computing of employee attendance including early/late control, payroll, **client/patient** billing data; but also reduces clerical cost by teaming with your IBM PC to provide timely and accurate management information on inventory, job costs, work in progress.



To learn the complete story on how the Intelligent Data Collector can increase your profits call or write today.

TECH-S

12997 Merriman Rd.
Livonia, MI 48150
(313) 425-9800

Send Information

☐ **ENERGY
OPTIMIZER**

Name: _____ Title: _____

Company: _____

Address: _____

City: _____ State: _____ Zip: _____

Number of Employees: _____

Type of Business: _____

An Energy Management System that takes directions from your IBM® PC

Intelligent Add-Ons by

TECH-S

12997 Merriman Rd. • Livonia, Michigan 48150 • (313) 425-9800 • Toll Free (800) 22TECHS

CIRCLE 418 ON READER SERVICE CARD

It Reads, Writes and It Paints in 3-D, Keeps and Talks to

It's called "OPEN ACCESS," and it's the result of 60 man-years of effort to create a truly do-it-all, super-program—one that can perform virtually every task you're ever likely to encounter.

The beauty of it is, all that capability resides on a single program. You don't have to re-enter data. Or spend time trying to get unmatched programs to work together.

OPEN ACCESS takes its name from the source of its power—a relational data-base manager that gives you access to more data in more ways than any comparable software.

OPEN ACCESS includes an electronic spreadsheet, 3-D graphics, word processor, appointment scheduler and telecommunications module—all revolving around the powerful information manager.



See us at COMDEX, Booth W648

1



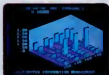
INFORMATION MANAGEMENT—THE MASTERMIND. This advanced data-base manager stores and retrieves multiple files quickly, easily and reliably. What's more, it shares all information with the other programs, so you never have to re-enter the same data twice.

2



ELECTRONIC SPREADSHEET—NUMBER CRUNCHING AND GOAL SEEKING. It helps you produce forecasts, cost estimates and "break-even" points—in seconds, instead of hours or days. Best of all, it allows "goal seeking." Ask, for example, "What sales must I have the rest of the year to net \$1 million?" and OPEN ACCESS will figure it out.

3



3-D GRAPHICS—NOT JUST PRETTY PICTURES. These graphics distill raw data into trends that can be instantly visualized, helping you discern the important facts from a wealth of information.

does Arithmetic. Your Appointments the World.

Because they do not have a dedicated relational data-base manager that can quickly direct massive amounts of data, other programs simply can't do what OPEN ACCESS can. Some don't have a communications program, others no dedicated word processor. None have a time management program.

There's just one conclusion: At \$595, OPEN ACCESS can do more for you than any other comparable business program on the market. Bar none. But the only way for you to be convinced is for you to see OPEN ACCESS work its magic on your work load. So call your local software dealer today, or call us at SPI, at 619-450-1526.



SPI

SOFTWARE PRODUCTS INTERNATIONAL

10240 Sorrento Valley Road
San Diego, CA 92121

CIRCLE 604 ON READER SERVICE CARD

4



WORD PROCESSING—EDITOR
EXTRAORDINAIRE! Superior word processors make it easy to correct typos, change words, shuffle paragraphs and format documents. This is one of that breed. Use it to write efficient memos, letters, proposals and reports.

5



TELECOMMUNICATIONS—YOUR LINK WITH THE WORLD. This program gives you access to virtually any other computer system in the world. Not only can you transmit and receive reports from your colleagues, you can also subscribe to special data banks that know everything from GM's stock price to the relative humidity in Genoa. Now that's power!

6



TIME MANAGEMENT—CONSERVING YOUR MOST PRECIOUS RESOURCE. This module helps you keep track of all your appointments, hour by hour, day in and day out. It alerts you to standing obligations, automatically coordinates meeting times with other busy professionals, and lists all your associates on a Rolodex™-like file.



THE FIRST AND ONLY INDEPENDENT STORE IN NYC DEDICATED TO IBM® PC SOFTWARE AND PERIPHERALS

IN STORE WE DEMONSTRATE MOST PRODUCTS WE SELL - BY APPOINTMENT ONLY

STORE HOURS: 9:00 A.M.—6:30 P.M. E.S.T. MON.—FRI.
10:00 A.M.—4:00 P.M. E.S.T. SAT.

PC LINK, CORP. 29 WEST 38TH ST. 2ND FL., NEW YORK, NY 10018

LOTUS 1-2-3. TK SOLVER

(NO MAIL ORDERS ON LOTUS PLEASE)

CALL
CALL

BUSINESS SOFTWARE

ALPHA SOFTWARE	
DATA BASE MANAGER II	\$205.00
EXECUTIVE PACKAGE	109.00
MAILING LIST	79.00
TYPE FACES	89.00

APPLIED SOFTWARE

VERSAFORM	275.00
ASHTON—TATE	
dbase II (PC DOS)	449.00
BOTTOM LINE STRATEGIST	299.00
FINANCIAL PLANNER	449.00
FRIDAY	239.00

CONTINENTAL

HOME ACCOUNTANT PLUS	95.00
FIRST CLASS MAIL	89.00
PROPERTY MANAGEMENT	379.00

EAGLE SOFTWARE

MONEY DECISIONS I & II	249.00
------------------------	--------

FOX & GELLER

D. GRAPH	CALL
DIUTL	CALL
QUICKCODE	CALL

HAYES

SMARTCOM II	89.00
-------------	-------

IUS

ACCOUNTING ARIAPGL	CALL
INVENTORY CONTROL	CALL
ORDER ENTRY	CALL
PAYROLL	CALL
EASY WRITER II	210.00
EASY SPELLER	119.00
EASY FILER	240.00
EASY PLANNER	169.00

LINK SYSTEMS

DATAFAK	199.00
---------	--------

LIFETIME SOFTWARE INC.

VOLKSWRITER	CALL
-------------	------

MICRO PRO

CALCSTAR	CALL
INFOSTAR	CALL
WORDSTAR	CALL
WORDSTAR PROFESSIONAL	CALL
SPELLSTAR	CALL
MAILMERGE	CALL

MICROSOFT

MULTIPLAN	185.00
-----------	--------

NORTH AMERICAN BUSINESS

MEMORY SHIFT	75.00
--------------	-------

NORTON COMPUTER

NORTON UTILITIES	55.00
------------------	-------

PEARLSOFT

PERSONAL PEARL	190.00
----------------	--------

SOFTWARE ARTS

FINANCIAL MANAGEMENT	CALL
MECHANICAL ENGINEERING	CALL

SOFTWARE SYSTEMS INC.

MULTIMATE	CALL
-----------	------

SOFTWARE PUBLISHING

P.F.S. REPORT	85.00
P.F.S. FILE	95.00
P.F.S. GRAPH	89.00

SORCIM

SUPERCALC II	177.00
--------------	--------

SOURCE

SOURCE	75.00
--------	-------

SOUTHEASTERN

DATA CAPTURE	99.00
--------------	-------

T.M.Q.

FILE FAX	135.00
----------	--------

TEXASOFT

VERSTEXT	139.00
----------	--------

VISICORP

VISICALC	179.00
VISICALC ADVANCED	329.00
DESKTOP PLAN	219.00
VISIFILE	219.00
VISITREND/VISIPILOT	219.00
VISWORD	CALL

DISK DRIVES

CORVUO HARD DISK 6, 11, 20 MB	CALL
TANDON TM 100-2	239.00
TANDON TM 50-2	225.00

EXPANSION BOARDS

UNIVERSAL RESEARCH	
MULTIDISPLAY CARD	CALL
64 RAM CHIPS	59.00
AST CARDS	CALL
QUADBOARD CARD	CALL
AMDEK MAIL CARD	CALL
QUAD LINK	CALL
PC MOUSE	CALL
FTG LIGHTPEN	CALL

ENTERTAINMENT & EDUCATION

APPLE PANIC	\$22.00
ATI TRAINING PACKAGES	ea. 65.00
BUG OFF	29.00
COMPUTER FACTS IN 5	29.00
CROSSFIRE	29.00
DEADLINE	39.00
FLIGHT SIMULATOR	35.00
FRIENDLY ARCADE	29.95
FRIENDLY PC INTRO SET	29.95
FROGGER	25.00
GORGON	29.00
HIDE & SINK	22.00
HI RES #4	29.00
LETTERMAN	26.00
MY LETTERS, NUMBERS & WORDS	32.00
PC TUTOR	55.00
PROFESSIONAL BLACK JACK	25.00
SERPENTINE	25.00
SPACE STRIKE	25.00
STAR CROSS	29.00
SPYDER	29.00
SUSPENDED	39.00
TACHYON	29.00
TYPING STRATEGIES	26.00
ZORK I, II, III	ea. 29.00
FUNSTATION	
BIG TOP	29.00
COSMIC CRUSADERS	29.00
MASTER MINER	29.00
SNACK ATTACK	29.00

ACCESSORIES

CURTIS PRODUCTS	
DISPLAY PEDESTAL	\$60.00
MONO CABLE	42.00
KEYBOARD CABLE	32.00
SYSTEM STAND	21.00
DIABLO RIBBON	5.50
EPSON TWIN PAK RIBBONS 7080	15.00
FLIP N FILE	24.50
KRAFT JOYSTICK	45.00
DISKETTE CASES	2.95
DESKTOP PRINTER STAND	CALL
KEYBOARD DRAWER	75.00
CRT, D/DRIVE & KEYBOARD COVERS	CALL

MONITORS

AMDEK 310A	\$169.00
COLOR I	CALL
COLOR II	CALL
NEC JC1203 RGB	649.00

MODEMS

HAYES SMART MODEM	\$215.00
HAYES SMART MODEM 1200	489.00
HAYES SMART MODEM 1200B	449.00

DISKETTES

DYSAN	
S.S./D.D.	\$33.00
D.S./D.D.	30.00

MAXELL

S.S./D.D.	26.00
D.S./D.D.	39.00

VERBATIM (5 year warranty)

21144 HEAD/CLEAN KIT	10.50
S.S./D.D.	26.00
D.S./D.D.	37.00

PRINTERS

DIABLO P32 D-MATRIX	CALL
DIABLO P38 D-MATRIX	CALL
DIABLO 820	CALL
DIABLO 830	CALL
DIABLO 630 TRACTOR FEED	\$249.00
CITHO PROWRITER 10P	390.00
PROWRITER 10S	575.00
PROWRITER 15P	665.00
PROWRITER 15S	729.00
STARWRITER F-10	1109.00
TRACTOR FEED F-10	250.00
PRISM 480	529.00
PRISM 132 COMPLETE	1499.00
OKIDATA 92P	510.00
93P	915.00
NEC 8023	419.00
SANYO PR5500 DAISY PRINTER	609.00
PRINTER CABLE/PARALLEL	35.00

IDS

PRISM 132 COMPLETE	1499.00
--------------------	---------

OKIDATA

92P	510.00
93P	915.00
NEC 8023	419.00
SANYO PR5500 DAISY PRINTER	609.00
PRINTER CABLE/PARALLEL	35.00

NEC

8023	419.00
------	--------

SANYO

PR5500 DAISY PRINTER	609.00
----------------------	--------

PRINTER

CABLE/PARALLEL	35.00
----------------	-------

All prices listed in this ad are valid as of Nov. 30, 1993. ALL BRANDS ARE REGISTERED TRADEMARKS. IBM IS A REGISTERED TRADEMARK OF IBM CORP.

CALL TOLL FREE 800-221-0343

CORPORATE ACCOUNTS WELCOMED IN NEW YORK CALL 1-212-730-8036

TERMS AND CONDITIONS

All prices reflect 3% cash discount. We reserve the right to repair, replace or return to manufacturer for repair. All goods acknowledged faulty or damaged on receipt by customer. Customer must call for Return Authorization Number before returning any goods. Prompt attention will be given to all damaged and faulty returned goods. Any goods returned for credit are subject to 10% restocking charge, plus shipping charge. No returns for credit on any software. Customer must deal with the manufacturer directly if the customer finds any false claims made by the manufacturer. Prices subject to change without notice. All advertised products are from our

present stock and subject to availability. All goods are shipped U.P.S. surface unless otherwise authorized by customer. Add 2% of price, or minimum of \$3.00 for shipping. We do not ship C.O.D. Please allow one to two weeks for personal or corporate checks to clear. To expedite shipping send money order, certified cashier's check or charge to your VISA—MasterCard, Diners, Carte Blanche (Minimum charge \$50.00 N.Y.C. add 8% N.Y. sales tax. N.Y. add appropriate sales tax. Terms, conditions and prices differ in our store. Prices subject to change without notice.

TIC TOC WE'VE GOT THE CLOCK

Enhance the performance of your IBM® PC or XT with RAM+3, a new multifunction board from Seattle Computer. It combines the most needed functions for your PC on a single card. This leaves the PC's other expansion slots open for your future needs. Here's what you get:



Lithium Powered Clock The RAM+3 clock/calendar eliminates the need to manually input the date and time each time you power up. And the inexpensive lithium battery ensures that the clock keeps accurate time even when the power is off.

RS-232 Serial Port It's an easy way to connect letter quality printers, modems and other peripherals to your IBM. It's compatible with IBM's Asynchronous Communications Adapter and can be selected as either COM1 or COM2. No translation software is required.

Parallel Printer Port Designed to operate most parallel printers, it is functionally identical to and completely compatible with the IBM Printer Adapter.

Memory Options To increase the memory capacity of your IBM, there are five RAM+3 memory options: 0k, 64k, 128k, 192k, and 256k. The memory expansion boards are socketed and expandable in 64k increments to 256k. For users who do not need to increase the memory of their PC but want the clock and added port capabilities, a no memory, unsocketed RAM+3 is also available.

FLASH DISK™ and FLASH PRINT™ To dramatically improve your PC's throughput, FLASH DISK lets you designate as much as 576k of RAM as a disk drive. And with FLASH PRINT, you can compute and print simultaneously. FLASH PRINT is a user definable buffer that lets you select, in 1k increments, as much as 63k of memory as a buffer. Your printer can run at its maximum speed while you continue to compute.

RAM+3 is Available and Affordable Seattle Computer RAM+3 boards are available through a nationwide network of retail outlets including ComputerLand stores. For the location of the outlet nearest you call toll free:

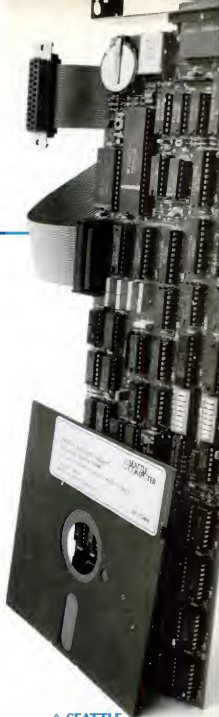
1-800-426-8936.

RAM+3 prices start at \$210.00*

*(Unsocketed, no memory version;

\$395 for the expandable 64k version)

®IBM is a registered trademark of International Business Machines Corporation



**SEATTLE
COMPUTER**

Seattle Computer Products, Inc.
1114 Industry Drive, Seattle, WA 98188

COMPUTER MAIL ORDER

PRICE CUTTERS software

data bases

VisiFile.....	\$199.00	Perfect Filer.....	\$239.00	TIM III.....	\$325.00
EasyFiler.....	\$239.00	Quick Code.....	\$199.00	FileManager Plus.....	\$89.00
InfoStar.....	\$279.00	dBase.....	\$69.00	pts. file.....	\$85.00
DataStar.....	\$175.00	dGraph.....	\$159.00	pts. report.....	\$79.00
Personal Data Base.....	\$99.00	dBase II.....	\$359.00	pts. graph.....	\$65.00
InfoScope.....	\$149.00			Condor 20-III.....	\$399.00

spreadsheets financial graphs

SuperCalc I.....	\$119.00	C-dex Training (each).....	\$49.00	Fast Graphs.....	\$185.00
SuperCalc II.....	\$155.00	Home Accountant Plus.....	\$95.00	Money Maestro.....	\$95.00
MuttPlan.....	\$175.00	1st Class Mail.....	\$79.00	Micro Plan.....	\$295.00
Lotus 1-2-3.....	\$329.00	Peachpack (GL/AP/AR).....	\$269.00	Profit Plan.....	\$125.00
Friday!.....	\$159.00	VisiCalc 4.....	\$209.00	California Corporation.....	\$75.00
VisiCalc.....	\$159.00	Scratch Pac.....	\$159.00	The Practical Accountant.....	\$109.00
VisiSchedule.....	\$209.00	Financial Planner.....	\$415.00	Business Policy Planner.....	\$75.00
VisiSend/Plot.....	\$209.00	EasyPlanner.....	\$159.00	Bottom Line Strategist.....	\$265.00
Desktop Plan.....	\$209.00	CalcStar.....	\$99.00	TK Solver.....	\$175.00
		Perfect Calc.....	\$119.00		

word processing

Volkwriter.....	\$115.00	Spell Check.....	\$155.00	MailMerge.....	\$155.00
SuperWriter.....	\$185.00	Benchmark.....	\$345.00	WordStar/MailMerge.....	\$369.00
Super Spell Guard.....	\$125.00	Benchmark Mail List.....	\$109.00	SpellStar.....	\$155.00
FinalWord.....	\$199.00	Memo Plan.....	\$129.00	VisiWord.....	\$265.00
Perfect Writer.....	\$155.00	Multi-Mate.....	\$329.00	VisiSpell.....	\$155.00
Perfect Speller.....	\$119.00	pts. write.....	\$89.00	EasyWriter II.....	\$219.00
Spell Binder.....	\$259.00	Word Plus PC.....	\$209.00	EasySpeller.....	\$115.00
		WordStar.....	\$255.00	WordStar Pro Pack.....	\$495.00

=WEST= =CANADA= =EAST=
1-800-648-3311 1-800-268-4559 1-800-233-8950

In NY call (702) 648-3654, Dept. 1117
 P.O. Box 6356, Scarsdale, NY 10583
 Order Status #: 585-5454

In Toronto call (416) 625-0886, Dept. 1117
 2505 Dundas St. East, Unit 18
 Mississauga, Ontario, Canada L5L1T1

In PA call (717) 327-9576, Dept. 1117
 477 E. Third St., Williamsport, PA 17701
 Order Status #: 327-9576

VISA

No risk, no deposit on C.O.D. orders. Pre-paid orders receive free shipping within the U.S. Continental United States with no waiting period for certified checks or money orders. Add 3% (minimum \$5.00) shipping and handling on all C.O.D. and credit card orders. Larger shipments may require additional charges. NY and PA residents add sales tax. All items subject to availability and price change. We stock manufacturer's and third party software for most all computers on the market. Call today for our new catalog.

COMPUTER MAIL ORDER



hardware

monitors

Amdek 310A.....	\$189.00	UBI PI 3.....	\$159.00
Amdek Color II.....	\$399.00	BMC 12" Green.....	\$85.00
Amdek Color III.....	\$349.00	Zenith ZVM 123G.....	\$199.00
NEC JB 1201.....	\$149.00	Zenith ZVM 122A.....	\$109.00
NEC JB 1205.....	\$199.00	Taxan 12G.....	\$129.00
NEC JC 1203.....	\$489.00	Taxan 12A.....	\$139.00
Quadchrome.....	\$489.00		

cards

Six Pak Plus. 64K-C, S, P.....	\$279.00
C, S, P, GP.....	\$309.00
Mega Plus II, 84K-C, S, P.....	\$309.00
C, S, P, GP.....	\$399.00
C, S, P, GP.....	\$279.00
Combo Plus II, 64K-C, S, P.....	\$279.00
I/O Plus II, C, S, P.....	\$136.00
C, S, P, GP.....	\$189.00
Quadram Quadlink.....	\$549.00
Quadram Quadboard.....as low as.....	\$309.00
Quadram Quad 512 Plus.....as low as.....	\$259.00
Quadram Quadcolor.....as low as.....	\$219.00
Quadram Chronograph.....	\$99.00
Parallel Interface Board.....	\$99.00
84K RAM Chips Kit.....	\$99.00

modems & communication

Hayes 300.....	\$219.00	Novation 103.....	\$186.00
Hayes 1200.....	\$519.00	Novation 103/212.....	\$439.00
Hayes 1200B.....	\$489.00	Anchor Mark VI.....	\$199.00
Hayes Smart Com II.....	\$99.00	Crosstalk.....	\$129.00
Hayes Chronograph.....	\$199.00	Remote.....	\$99.00
Novation J-CAT.....	\$119.00	Transporter.....	\$199.00

printers

NEC 3550.....	\$1799.00	C.Roh 8510P.....	\$379.00
NEC 8023.....	\$399.00	C.Roh F10-40.....	\$149.00
NEC 8025.....	\$729.00	8MC 401.....	\$699.00
Okidata (92, 83, 84, 92, 93).....	CALL	Daisywriter 2000.....	\$1099.00
Epson.....	CALL	Disble 830.....	\$1789.00
(RX80, MX80FT, FX80, FX100 & MX100).....		Amdek DXY-100 Plotter.....	\$599.00
Gemini 10X.....	\$289.00	Comiter II.....	\$499.00
Gemini P15.....	\$449.00	Smith Corona TP-1.....	\$489.00
Gemini Delta 10.....	\$549.00	Smith Corona TP-2.....	CALL

disk drives

Tandem 8 1/4" 320K.....	\$249.00
Amdek II.....	\$219.00
Amdek II.....	\$499.00
Percom 5 Meg Hard Disk w/Controller.....	\$1399.00
Percom 10 Meg Hard Disk w/Controller.....	\$1699.00
Percom 15 Meg Hard Disk w/Controller.....	\$2099.00
Percom 20 Meg Hard Disk w/Controller.....	\$2399.00

= WEST = = CANADA = = EAST =
1-800-648-3311 1-800-268-4559 1-800-233-8950

In NY call (702) 568-5654, Dept. 1117
 P.O. Box 5699, Slateline, NY 69446
 Order Status #: 568-5654

In Toronto call (416) 628-0866, Dept. 1117
 2505 Dunwin Ct., Unit 18,
 Markham, Ontario, Canada L3L 1T1
 Order Status #: 628-0866

In PA call (717) 327-9578, Dept. 1117
 477 E. Third St., Williamsport, PA 17701
 Order Status #: 327-9578

CANADIAN ORDERS: All prices are subject to shipping, tax and currency exchange fluctuations. Call for exact pricing in Canada.
INTERNATIONAL ORDERS: All shipments outside the Continental United States must be pre-paid by certified check only, include 3% (minimum \$5.00) shipping and handling. **EDUCATIONAL DISCOUNTS:** Additional discounts are available to qualified Educational Institutions. APO & FPO: Add 3% (minimum \$5.00) shipping and handling.

MasterCard



BLUE LYNX

The

Micro-Mainframe Link

Replace your dumb terminal with a Blue Lynx equipped PC or XT and still have the full facilities of your terminal!

- Do offline processing with data from your mainframe, and send your results back to it.
- Extended upload/download features allow easy unattended operation—perfect for autoanswer environments.
- Develop and test new mainframe applications *offline* on the PC, then let BLUE LYNX upload your debugged source code.
- Save on connection costs and conserve CPU resources by going online only for the jobs the mainframe can do best.
- Have access to the full range of software available for the PC—for spreadsheet calculation, word processing, time management and more.
- Use full printing capabilities—locally-initiated print, host-initiated printer echo and host-initiated printing independent of terminal display.
- Work at home, if you like, with the full resources of your mainframe and your PC.
- Get a superior combination of features at a truly competitive price.
- Get a product that is fully supported, sold by the people who developed it and who can provide custom-environment versions on request.

Why play dumb? Let BLUE LYNX do the talking. Choose the package you need:

3276 emulation with SNA/SDLC or Bismyn, hardware and software package \$690 complete or \$1230 complete for SNA/SDLC and Bismyn, software selectable—all versions. Available now.

5251 emulation for S/34, S/36 & S/38 users, hardware and software package \$690 complete—Available now

**VTIRM
DEC VT100/52
emulation**
software package
(requires IBM
Asynchronous
Communications
Adapter or
equivalent)
\$125 complete—
Available now

Over 500 installed



(212) 664-7788

**TECHLAND
SYSTEMS INC.**
25 Waterside Plaza, NY, NY 10010

CIRCLE 488 ON READER SERVICE CARD

BLUE LYNX is a trademark of Techland Systems Inc.

**IBM PC 256K
2X 320 KB DS/DD DISK DRIVES
FLOPPY DISK CONTROLLER
COLOR CARD
ALL FOR \$2599**



**IBM PC256K COLOR GRAPHICS BOARD FLOPPY DRIVE CONTROLLER
WITH PARALLEL PORT 360KB DS/DD DISK DRIVE, PRINTER, CABLE
DOS 2.0, 10MB HARD DISK SUBSYSTEM INCLUDES CABLE,
CONTROLLER, POWER SUPPLY, CABINET, SOFTWARE**

DISK DRIVES FOR IBM PC

Double Sided/Double Density 320KB \$225

HARD DISK FOR IBM PC

5MB \$1399 10MB \$1599 15MB \$2199

MEMORY BOARDS

AST MULTIFUNCTION \$299

AST I/O PLUS \$199

QUADRAM 256K MULTIFUNCTION... \$399

HERCULES CARD \$499

QCS BIG BLUE CARD..... \$479

HAYES

SMARTMODEM 300 BAUD \$239

SMARTMODEM 1200 BAUD \$559

MONITORS

PQS COLOR MONITOR HX-12 \$499

AMDEK, NEC MONITORS AVAILABLE . CALL

APPLE IIe STARTER SYSTEM \$1599

DISK DRIVE FOR APPLE II & IIe ... \$219

PRINTERS

BROTHER HR-1 \$750 HR-15..... \$499

OKIDATA 82A. \$499 83A \$699

84A \$999 93A \$959

GEMINI 10 ... \$359 15 \$529

NEC 3510 .. \$1499 3550 \$1899

7710 \$2075

EPSON RX80 . \$379 FX80 \$599

MX80 \$449 MX100 \$649

HAYES SMARTMODEM 300 BAUD ... \$239

HAYES SMARTMODEM 1200 BAUD .. \$559

VISICALC \$199 MULTIPLAN .. \$199

LOTUS 1-2-3... \$359 WORDSTAR .. \$329

SUPER CALC II \$199 MAILMERGE.. \$179

WORD PERFECT \$349 EASY WRITER \$129

TAVA PC

Desk Top, IBM PC Compatible Computer, Runs

DOS 1.1, 2.0, CP/M86 \$1025

COMPUTER POST INC.

22102 CLARENDON ST. STE. #1
WOODLAND HILLS, CA 91367
(213) 999-1041

DELIVERIES TWO TO FOUR WEEKS AVERAGE
ALL SHIPMENTS ARE CASHIERS CHECK ONLY.
PRICES SUBJECT TO CHAGE WITHOUT NOTICE.
SHIPPING AND HANDLING EXTRA



This is not a game.

Introducing **BLACKJACKPRO**. The computer aided learning tool that teaches you to **BEAT THE HOUSE**.

BLACKJACKPRO is not a game. It is serious business.

This tutorial will teach you the probability based system that expert players have been using for years.

Phone orders may be placed 24 hours a day by calling (212) 582-2006 or (613) 594-7855, or toll-free at 1-800-223-6015.

Mail orders and requests for information should be sent to
SKILLWARE CORPORATION
 Applied Probability Dept.,
 2nd Floor
 314 West 53rd Street
 New York, New York 10019

BLACKJACKPRO is a trademark of **SKILLWARE CORPORATION**.
 IBM, APPLE II, and TRS-80 Colour Computer are registered trademarks of International Business Machines Corp., Apple Computer Inc., and Tandy Corp.

BLACKJACKPRO simulates actual game situations to condition you to make the right play effortlessly.

By patiently correcting your mistakes, **BLACKJACKPRO** teaches you the multi-level decision-making process that will make you a lifelong winner.

BLACKJACKPRO will pay for itself. You will be a **WINNER** and go **UNDETECTED**.

The introductory price is \$75.

Versions are now available for the IBM PC®, APPLE II®, and TRS-80 Colour Computer®.

Why wait? We're ready to take your order.

Please send me _____ **BLACKJACKPRO** tutorials @ \$75. each.

☐ IBM PC ☐ APPLE II ☐ TRS-80 Co. Co. Diskette ☐ TRS-80 Co. Co. Cassettes

Total amount enclosed \$ _____

Name _____

Address _____

City _____ State _____ Zip _____

 Account # _____ Exp. Date _____

 Signature _____

C.O.D. orders gladly accepted (\$2.00 additional). Please allow two weeks for personal checks to clear. N.Y. State residents please add sales tax.

CIRCLE 578 ON READER SERVICE CARD

Competitors abound in the personal computer marketplace. Though Apple leads the field in 1983 shipments, industry watchers consider IBM a sure bet for 1984.

A PC By Any Other Name . . .



The personal computer marketplace abounds with IBM PC competitors. The Eagle PC, Altos 586/10, Dato General's Desktop Generation Model 10 are shown here.

The IBM PC cornered 20 percent of the personal computer market in its first year. Although this figure suggests that the PC is superior to its competitors, many market watchers disagree. They sum up the PC's dominance in the marketplace with the question: What's in a name?

Many non-IBM personal computer manufacturers will readily state that their products are better than the PC, and some will stay around to argue the point.

According to the marketing analysts, Apple Computers is still the leader in the

field (see Figure 1). Apple II and Apple III continue to sell in the domestic market to both hobbyists and home professionals, while the Lisa, with its price tag of \$10K, is clearly aimed at the business user. Does a price tag this high exclude it from the PC marketplace? "IBM is just the automatic competition," says Barry Smith, product marketing manager for the Apple Personal Office System. "Lisa is a very different machine. It sets the standard of what people will expect in coming years. Lisa's strength is its ability to develop applica-

tions much more quickly. A corresponding IBM machine is not yet available, but would cost at least as much." Smith has no way of knowing whether the arrival of the PC has hurt Apple's sales figures, but right now he is not worried. "We are selling everything we can build and are backlogged to 1984. Many people will not buy an ordinary personal computer because it is just too difficult to use . . . but as one who uses a Lisa will return to another computer. Lisa is for the people who have always hated computers."

Break Away from the Pack with the Maverick SMD Rigid Disk Controller by Interphase.



Three times faster than an XT...and removable media too!

Interphase brings you the most powerful disk controller available for your IBM or IBM compatible personal computer. With the Maverick, your PC can use any of the dozens of high performance disk drives supporting the industry standard SMD interface. You can have capacities ranging from 16 to 1600 megabytes or more — enough for even the largest accounting or data base management applica-

tions. You can have fixed media or removable cartridges or a combination of the two — just the thing to handle your back-up and archival problems. Plus you get three to four times the performance of the current Winchesters.

To find out more about the Maverick disk controller or our turn-key disk subsystems contact Interphase today.

Ride with the thoroughbreds from Interphase.



INTERPHASE
corporation

2925 Merrell Road, Dallas, Texas 75229 214/350-9000 Telex 73-2561 (TELESERV) DAL
CIRCLE 364 ON READER SERVICE CARD

Figure 1: Comparative shipment figures from the Yankee group show IBM and Apple as the leaders in the personal computer marketplace. While Apple holds the lead this year, IBM will take first place in 1984.

	IBM	Apple
Market Share (Shipments)		
- to end of 1982	160,000	270,000
- to end of 1983 (projected)	600,000	700,000
- to end of 1984 (projected)	1,100,000	1,000,000
Primary Buyers	Fortune 2,000 Small Businesses	Education Small Businesses
Television Advertising		
Expenditure to end of 1982	\$19.7m	\$2.7m
Date Announced	August 1981	January 1981
Current Share Price	\$105	\$41
Growth Rate	562.5%	333.3%

PC Competitors

The Lisa may not be a direct competitor, but the IBM PC competes with Apple, Eagle, Altos, Data General (DG), and several others for the segment of the market known as the "business professional." Apple, Altos, and Data General believe that their comparative offerings are more up-market and business-oriented than the PC. But the businessman, with the check in his hand, may not agree. His decision is often based on gut feeling rather than on logical calculation. And his gut feeling may be the name IBM.

Eagle aims to compete with the PC in every category, but to offer a better machine at a lower price. "The Eagle PC has 512K RAM, is 9 pounds lighter, has 105 keys, including 25 user-friendly ones, and is quieter in operation," says Ron Mickwee, president of Eagle Computers. "The base promotional IBM is \$2,559, the Eagle \$1,995. But if you take a typical Eagle with two slim-line disks (which the PC doesn't have), with MS-DOS, and word processing and finance programs, we come in at \$3,495, while the PC is over \$4,000. We achieve a pretty consistent \$500 difference." A discount of 12.5 percent is always worth a second look, but Data General claims an even greater one for its new Desktop generation Model 10, which is the bottom of a new range of three micros claimed to allow the user to make a smooth transition from the personal computer, to its 32-bit supermini, the MV8000. The user can convert "mini" software downward to run on the personal computer—either DG's or the IBM PC. Conversion is achieved through standard software and takes only a few hours.

"Yes, our Model 10 is better than the

PC," says Jan Pieter, product marketing manager of Data General's technical products division. "It has two cards using an Intel 8088 and a DG microEclipse, one or two floppies, one or two 15-megabyte Winchester, up to 768K RAM, graphics as standard, a keyboard of 128 keys, and a screen that can be green on black, or 16 concurrent colors from a possible palette of 4,095." The Model 10 is fully PC compatible, running under CP/M and MS-DOS in parallel, and under RDOS, AOS, and DG's real-time interactive operating system, MP/AOS. A Model 10 base system with 128K RAM, one Winchester, and a green on black screen with graphics costs \$3,165. A similar IBM PC system costs about \$800 more.

Altos Computers believes its machines address a more upstream business market than the PC, and it intends to advance this

that its machine will be obviously superior. "The drive capacity is higher, the RAM/disk storage is higher, the bit-map graphics display gives higher resolution, the processor is 8 MHz, the screen is 14 inches compared to IBM's 12, the 586/10 has more function keys, a built-in calculator, and a choice of operating systems."

Self-Fulfilling Prophecy

In the price/performance race, the PC doesn't finish first; manufacturers and market observers agree that plenty of other personal computers can, and do, beat it. But IBM still holds a sizable corner of the market; buyers may not be basing their decisions on the evidence, but they are buying PCs. One new personal computer magazine, in its first issue, attributed part of the PC's success to the software companies, many of which want to write programs for the PC only. And, indeed, attracting software companies was IBM's intention. According to a Boca Raton spokesman, "IBM wanted the PC to be an open system and to encourage others to write for it."

Getting the software companies to comment is difficult. A spokesman for Microsoft will say only that the company respects agreements with all OEMs equally, and that most of the large, reputable software houses hold the same policy. Only the lesser ones have been trapped into concentrating on IBM. Bob Bir, manager of marketing communications at State of the Art, in Costa Mesa, California, is less reticent. "We haven't concentrated much on the PC, but from the outset we were prepared for it," he says. "Many peripheral and software companies are putting their money on IBM. It creates a

M_{ANY}
peripheral and software
companies are putting
their money on IBM. It
creates a self-fulfilling
prophecy.

trend. The model 586/10 currently costs \$7,990, but is to be upgraded shortly to a level where its capabilities will considerably exceed those of the PC. Ron Conway, vice president of marketing at Altos, states



WE'RE VERY HARD ON OUR SOFTWARE

You might even say we're perfectionists. Because at Softsmith™ we give our software the hardest workout, the toughest testing, the most rigorous evaluation. The result is software that has earned our confidence, and will justify your trust.

In particular, we do three things that make Softsmith software the most dependable you can buy.

1.

We're picky. Out of the hundreds of programs Softsmith evaluates every month, we choose to publish very few. A lot of good programs are rejected; but we think you can't be too picky when it comes to personal computer software. Our selectivity is your best assurance of quality.

2.

We complain a lot. If you were a programmer, and Softsmith accepted your program, you would have a right to be proud. But you shouldn't go on vacation yet. Because no matter how good that program may be, Softsmith evaluators will suggest some improvements; politely, but firmly. We may complain a lot, but people thank us later.

3.

We insist on plain English. After we've made the best program better, we're still not finished. Because we know that even the best program is no good if it's too hard to use. So we put a lot of time and effort into translating our instructions from computerese into plain English.

We publish software you can trust. Yes, we pick our programs carefully. And complain a lot to make them better. And insist on plain English instructions. The result is a library of personal computer software you can depend on. Even if you don't know a Pascal compiler from an emulation subroutine.

Softsmith has programs you can trust for all the most popular personal computers. Programs for Education, Home Management, Entertainment, Word Processing, Business, Communications and Programming. Ours is the largest library of quality software under one brand name.

So before you choose a software package for your computer, make sure someone's taken the time to be hard on it. Make sure it's Softsmith, the software you can trust.

Ask for Softsmith brand software wherever computers or software are sold. Or call us TOLL-FREE at (800) 341-4000 for the name and location of your nearest dealer.

Softsmith Corp., 1431 Doolittle Dr., San Leandro, CA 94577. A company of The Software Guild®

SOFTSMITH™

SOFTWARE



LIBRARY



CLONE YOUR IBM PC WITH MULTI-RAM™

Integrated software, programs that work simultaneously and share information between them, is here today. With Multi-RAM, from Softsmith™ Corporation, you can integrate your present IBM PC software for less than \$100.*

Think of it! You can simultaneously run up to 9 programs on your IBM PC or XT: your spreadsheet, word processor and data base, plus six other programs all at the same time. You can easily shift between those programs in a fraction of a second using a single key. And for the first time you can extract and move data or text from one program to another, instantly, and without losing any of your original data.

Multi-RAM actually enhances your IBM operating system to partition the machine memory (128K RAM minimum required) into as many as 9 segments.

Multi-RAM is also the first program that gives you the option of using your IBM PC with two monitors at once, each displaying a different program. Use word processing, for example, on one monitor, and a spreadsheet program on the second. Your computer never had such flexibility.

Multi-RAM is brand new, but that doesn't mean it's unproven. At Softsmith, we carefully test, improve and clearly document all of our programs, to make our software the most dependable you can buy. And we back it with a Toll-

Free customer service number you can use to get expert help, anytime.

Softsmith has the largest library of programs under a single brand name — quality programs for Education, Home Management, Entertainment, Word Processing, Business, Communications and Programming, for the most popular personal computers.

Ask for Softsmith brand software wherever computers or software are sold. Or call us Toll-Free at (800) 341-4000 for the name and location of your nearest dealer.

Dealer inquiries invited.

IBM PC and IBM XT are registered trademarks of International Business Machines, Inc.

*Based on suggested retail price.

CIRCLE 405 ON READER SERVICE CARD

SOFTSMITH™

SOFTWARE



LIBRARY

WE'LL BEAT ANY PRICE

BY **\$10**

AND THANK YOU
FOR THE
PRIVILEGE!

EVEN ITEMS NOT CURRENTLY ADVERTISED BY LOGICSOFT

Tell us the advertiser and price for any IBM-PC software package advertised in this issue and we'll not only meet it, but beat it by \$10. This offer does not apply to those packages whose advertised price is under \$100 or where LOGICSOFT's price is already the lowest.

WORD PROCESSING

MULTIMATE \$279
PERSONAL WORD PERFECT \$119
PEACHTEXT 5000 \$219
VOLKSWRITER \$119
EDIX & WORDIX \$269
EASYWRITER II \$195
MULTI-TOOL WORD w/o mouse \$239
MULTI-TOOL WORD w/mouse \$299
FINALWORD \$195
SUPERWRITER \$165
PERFECT WRITER \$199
VISIWORD \$265

DATA BASE MANAGEMENT

dBASE II \$389
QUICKCODE \$175
KNOWLEDGEMAN \$329
TIM III \$269
PFS:FILE \$95
PFS:REPORT \$79
CONDOR III \$395
VERSAFORM \$245
DATAKEEP \$329
DATAEASE \$239
EASYFILER \$235
FRIDAY \$189

SPREADSHEETS/GRAPHICS/COMM.

1-2-3 \$325
MULTIPLAN \$159
SUPERCALC2 \$159
VISICALC \$159
TISOLVER \$215
MULTI-TOOL (Inquire)
CHARTMAN II & IV \$359
FAST GRAPHS \$189
CHARTMASTER \$279
BPS GRAPHICS \$289
CROSSTALK XVI \$109
SMARTCOM II \$75

ACCOUNTING/FINANCIAL/MGMT.

MBSI \$575/module
CYMA (Inquire)
IUS (G/L, A/R, A/P) \$869
PEACHPAK SERIES 4 \$229
PEACHTREE SERIES 8 \$379/module
STATE-OF-THE-ART (Inquire)
PROJECT SCHEDULER (SCITOR) \$195
DOW JONES MARKET ANALYZER \$269
MARKET ANALYST (ANIDATA) \$375
FINANCIER PERSONAL SERIES \$119
FINANCIER TAX SERIES \$99
HOME ACCOUNTANT PLUS \$89

★ AND 400 OTHER TITLES ★

All of the above titles are registered trademarks.

In software...we're the LOGICAL CHOICE

800-SUPPORT

Logicsoft offers TOLL FREE, unlimited, software technical support for all our clients.
Dial: 1-800-645-3491 516-741-0043 (N.Y.S.)

software exclusively for the IBM-PC
We carry ALL available IBM-PC software.

Add 2% for shipping and handling.
N.Y.S. residents add sales tax.
20% deposit for C.O.D. orders.



C.O.D.
Check
Money-Order



Purchase orders accepted by qualified institutions.
No surcharge for credit cards.

LOGICSOFT

A Subsidiary of The Logic Group
300 Garden City Plaza, Garden City, N.Y. 11530

Continental U.S.

1-800-645-3491

NY State: 516-741-0043

Canada: 416-283-2354

Interex:

Int'l: 230199 Swift UR LGS

Dom: 960127 Swift NYK LGS

CIRCLE 282 ON READER SERVICE CARD

self-fulfilling prophecy." State of the Art develops and introduces its products on the Apple and then moves them across to the IBM.

Both software houses and dealers agree that IBM's entry into the personal computer business was preceded by a brilliant marketing campaign. IBM's presence in

the marketplace has validated the entire personal computer industry, and its micro will most likely dominate the market by 1984. PBX manufacturers, Rolm and Northern Telecom, quickly announced the ability to network the PC because, as they recently explained, there is more demand for the IBM PC than for any other

personal computer." Demand was not as high, however, when the networking capabilities were announced. Is this another case of a self-fulfilling prophecy?

A dealer who does not wish to be named has seen his marketplace grow since the arrival of IBM. "Purchasers from corporations who might not otherwise have bought a personal computer have bought the IBM PC, but Apple sales have stayed much the same. I stock the PC, but as soon as we get them in, they go out the door, mostly to corporations."

The MICROWRITER™ Daisy Wheel Printer.



Price \$680

Features:

- Microwriter parallel interface mounted internally in the Olivetti Praxis machine
- Built in self test
- Portable...comes with deluxe carry case
- Low noise level
- Slim modern styling
- Print quality is identical to the finest office typewriters on the market
- Can tab
- Rule single lines both vertically and horizontally
- Underline
- Print at 10, 12, or 15 characters per inch (switch selectable)
- Ten character memory automatic error correction, with lift-off carbon film correction ribbon (for typewriter use)
- Automatic or programmable page formats
- Handles letter, legal size sheet and fanfold paper in widths up to 12 inches wide
- 165 character/12 inch print width
- Wide selection of 21 interchangeable daisy print wheels available
- Ribbon cassettes just drop in
- Switch selectable European keyboard
- Centronics compatible parallel cables are currently available from stock

With the Microwriter you will never again have to send an important letter or a simple correspondence that doesn't look impressive. Why settle for just any printer when you can have a MICROWRITER—a fine letter quality typewriter for you and your computer. For more information, see your local computer dealer or contact Ammicro directly.

ammicro™ corp

122 East 42 Street, Suite 1700, New York, N.Y. 10168

(212) 254-3030

CIRCLE 107 ON READER SERVICE CARD



HAD ANY other company come out with the PC, it would have failed. It's just good—adequate, not great.

Apple is considered sure to survive the coming shakeout in the professional sector of the personal computer market and can afford to state openly what others only dare to suggest. Says Smith, "Hed any other company come out with the PC, it would have failed. It's just good—adequate, not great. But 95 percent of the equation is IBM. . . . IBM just delivers a piece of hardware and relies on third parties." Smith's opinion of IBM hardware is echoed by analysts and competitors. "Not wonderful" and "low tech" were two recurring comments, but many congratulate IBM on turning away from its usual policy and encouraging third parties to write the software that it is not staffed to write internally.

"IBM is more marketing-sensitive than most institutions of its size," says Mickwee. "It saw the advantage of relying on third parties and took it." It has also played on its reputation for service and support for all it was worth, although support in this end of the market appears largely uniform. Any company providing less than excellence would promptly be thrown out of business by its primary market outlet, the dealers.



Memorable.

With 3M diskettes, your computer never forgets.

3M diskettes remember everything, every time. Because at 3M, reliability is built into every diskette. We've been in the computer media business for over 30 years. And we've never settled in. We're constantly improving and perfecting our product line, from computer tape and data cartridges to floppy disks.

3M diskettes are made at 3M. That way, we have complete control over the entire manufacturing process. And you can have complete confidence in the reliability of every 3M diskette you buy.

Look in the Yellow Pages under Computer Supplies and Parts for the 3M distributor nearest you. In Canada, write 3M Canada, Inc., London, Ontario. If it's worth remembering, it's worth 3M diskettes.



3M hears you...

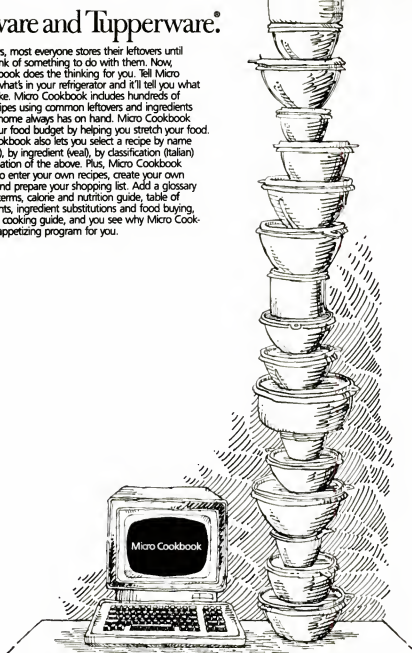
3M

CIRCLE 505 ON READER SERVICE CARD

Software and Tupperware®.

These days, most everyone stores their leftovers until they can think of something to do with them. Now, Micro Cookbook does the thinking for you. Tell Micro Cookbook what's in your refrigerator and it'll tell you what you can make. Micro Cookbook includes hundreds of delicious recipes using common leftovers and ingredients most every home always has on hand. Micro Cookbook stretches your food budget by helping you stretch your food.

Micro Cookbook also lets you select a recipe by name (Veal Picatta), by ingredient (veal), by classification (Italian) or a combination of the above. Plus, Micro Cookbook allows you to enter your own recipes, create your own cookbook and prepare your shopping list. Add a glossary of cooking terms, calorie and nutrition guide, table of measurements, ingredient substitutions and food buying, storage and cooking guide, and you see why Micro Cookbook is an appetizing program for you.



VIRTUAL COMBINATICS

P.O. Box 755, Rockport, MA 01966 (617) 546-6553

Look for Micro Barmate, the computer age bar guide and companion to Micro Cookbook.

Versions available for APPLE II + , APPLE IIe (80 column) and IBM PC (64K, PC DOS). The cost, \$40. Available at your favorite dealer or by mail. VISA, MC or phone orders accepted. Please add \$1.50 handling charge.

APPLE, IBM and Tupperware are registered trademarks of Apple Computer, Inc., IBM Corporation and Dart Industries, Inc., respectively.

"I wrote the book on WordStar— then I fell in love with the Idea Processor!"

"In a sea of software, it's refreshing to find a product that lives up to its claim of being unique. The Idea Processor combines a first class word processing program (the Editor) with an efficient text data management system (the Cardfile), and then makes it easy for the user to switch from one to the other. I know of no other program that lets you retrieve indexed material from your Cardfile and insert it directly into your document, or that lets you store parts of the document as indexed cards, or allows you to revise material in the Cardfile without leaving your edit session. The only factor more striking than this program's convenience is its simplicity. Because the Idea Processor takes advantage of the IBM PC keyboard's special function keys, its commands are so simple that you can learn them in an afternoon. The on-screen prompt line is a clever command review—inoffensive, because it doesn't interfere with your text, but complete enough to include the edit commands you need most often. The Cardfile's commands are even easier to use, thanks to their menu format."



CJ Puotinen, author of *The Last Word on Wordstar*
(Holt, Rinehart, & Winston)

"If you've been dreaming about the perfect research and writing tool, a program that really marries word processing and text database management, it's safe to wake up.
The Idea Processor has arrived."

An expert on word processors, a professional writer, and a dedicated Idea Processor enthusiast—that's C.J. And that could be you, too. If you write—memos, books, articles, letters, contracts, programs, term papers—you should be using the Idea Processor. Its Editor is the finest available for the IBM PC or, for that matter, for any computer. Its formatting capabilities include automatic footnote placement, auto-indexing, and the inclusion of graphs and pictures in your document. Just for those reasons alone it's your best text processing choice. But the real kicker is the Cardfile-Editor interface. The most powerful text database management system ever, fully integrated into the editing function, means that you can build your document while constantly referring to and excerpting as many text databases as you wish. The databases can interlock, can contain tens of thousands of words each, and can contain graphs and pictures as well as text. Each entry can be up to 8000 characters long, and is indexed by up to 10 keywords. Naturally, you can swap text in either direction—from Cardfile to document, or vice versa. So do as C.J. and professional writers from many fields have done. **If you think when you write—write with the Idea Processor!**

The Idea Processor

\$295

Integrated editor and cardfile program, text formatter, graphics management to
integrate graphics from other programs into document and cards

Requires an IBM-compatible personal computer with 192K of memory

From your dealer or:


225 Lafayette St.
New York NY 10012
212-334-8043

Visa and MasterCard

Idea Processor is a trademark of IdeaWare Inc.

IBM is a trademark of International
Business Machines Inc.

WordStar is a trademark of Micro-Pro International Inc.

WHEN RESULTS COUNT... COUNT ON QUIKCALC.



QUIKCALC... Is not another spreadsheet!

It's your solution to financial problem-solving. QuikCalc enhances the conveniences of a spreadsheet with a complete set of templates for sound decision-making!



QUIKCALC... Is your complete solution!

With QuikCalc, an integrated, neatly formatted analysis allows any input variable to be changed. These changes are then fully reflected throughout the entire analysis. Decision making has never been better oriented!

QUIKCALC... Is your professional solution!

QuikCalc is designed by CPAs and other business professionals who offer their experience and careful analyses at a fraction of their hourly billing rate!

QUIKCALC... Is the necessary for popular spreadsheets!

QuikCalc is now compatible with any of your VisiCalc or SuperCalc programs. Its "worksheet" approach—turn on your system, load your spreadsheet, and then load QuikCalc—makes QuikCalc easier, faster, and more flexible than typical menu-driven systems. There's no better way to do financial analyses!

QUIKCALC... Is your easy solution!

QuikCalc's concise, step-by-step manuals alleviate the need for computer experience. Simply change an assumption, recalculate and review your new results. Concentrate on your assumptions, not routine calculations!



THE REAL ESTATE INVESTOR \$129.95

Join the thousands of users who have found The Real Estate Investor to be the best real estate analysis package on the market!

- Analyzes a completely integrated analysis of any type of property
- Developed for investors, realtors and even sophisticated home buyers
- Analysis includes all tax impacts, choice of depreciation methods, and a complete projection—all summarized into an internal rate of return calculation
- Handles all types of financing—conventional, variable rate, balloon mortgages

"Excellent!"—InfoWorld Review, June 27, 1983

THE LOAN ANALYZER \$99.95

The Loan Analyzer's handy and complete analysis of any mortgage or loan has secured its use by banks and financial analysts nationwide!

- Calculates the effective interest rate, closing costs, full amortization schedules, balloon payments, interest paid after term, balance at a given date, and the effects of early termination
- Automatically solves for loan amount, term or payment
- Completely eliminates the need to ever use payment tables again
- Useful for car loans, school loans, equipment financing, real estate, etc.
- Makes shopping for a loan easier than ever before!

START BUILDING YOUR QUIKCALC LIBRARY NOW!

QuikCalc products are available in many popular disc formats from most computer stores or from Simple Soft.

Specify IBM PC, Apple, Vector, 8-inch CP/M or Kaypro formats. The IBM version works on all IBM compatible systems.

A minimum of 80K and VisiCalc or SuperCalc is required. To place orders only **800-323-8568 x101**. For information **312-364-0752**. Visa, MasterCard or C.O.D. orders accepted.

Simple soft

480 Eagle Drive, Suite 101, Elk Grove, IL 60007

QuikCalc and Simple Soft are registered trademarks of Simple Soft, Inc. VisiCalc is a registered trademark of VisiCorp. SuperCalc is a registered trademark of Sorbus Corp. SimpleSoft is a subsidiary of Pioneer Computing Inc.

CIRCLE 402 ON READER SERVICE CARD

© 1983 Simple Soft, Inc.

IBM does not move carelessly in the marketplace. It aroused public interest for a 16-bit micro, waited, as did Data General and Hewlett-Packard, until the domestic end of the business divorced itself from the professional end, and then came in with the first 16-bit product. Leasing 500 PCs to its notional accounts at somewhat favorable prices was also a shrewd way of pre-empting choice. Says Steve Ruddock of Hewlett-Packard's Personal Computer Group, "IBM put its resources into its distributing channels and advertising, not into the product itself. The software companies just saw the writing on the wall." And the buyers saw the writing on the machine. Says Ron Conway, "The success of the PC is due to three letters: I, B, and M. As the well-worn industry saying goes, 'You don't lose your job by buying IBM.'"

But are good marketing and an established name enough to justify the unquestioning acceptance of the IBM PC as the industry standard? Andrew Seybold, of Seybold Publications, says, "IBM only makes the keyboard [of the PC], which is the worst part of it. If it had any other name, it would have been an also-ran. The sad thing is that research into the 32-bit micro has been put on hold because IBM's 16-bit is now the standard. We're inundated with clones, look-alikes. If personal computers didn't have to look like PCs, there would be better machines on the market."

IBM's marketing today merely reinforces the efforts of over 20 years ago when it leased mainframes to all the major United States colleges at very favorable rates. "We all played with those machines and got used to them, and then we left college and went into business and bought them because we knew them," observes Seybold. Younger ambitious men checked what their seniors had done and simply followed in their footsteps. The conservative belief that methods of past success bring future success has created the big establishment of IBM Blue. Sighs Seybold, "I wish I could say something different but I don't think it's ever going to change."

Still, the competition is out there. Some of the other personal computers on the market are cheaper, some better, and most are at least comperable. IBM's PC is the industry standard, but a PC by any other name...

/PC

THE INTEGRATED ACCOUNTING SYSTEM

MAXI ACCOUNTANT

Maxi Accountant - Designed to handle the business needs of tomorrow — "Today", and you don't have to be an accountant to use it.



Features include:

Fully integrated modules -thirteen major programs contained within Maxi Accountant interact with one another allowing minimal disk handling or runs on any hard drive

Extensive reporting capabilities

Comprehensive, easy to use documentation - including tutorial

Technical support

Accounts Payable

- Check writing with automatic posting to Vendors and Bank Account
- Enter A/P invoices with automatic posting to inventory and purchase orders
- Supports partial payments, Aged A/P balances, and Earned discounts
- Monthly Check, Deposit and Petty cash register
- Complete Audit Trail
- Detailed Vendor Activity and Cash Requirements Report
- Uses same commercially available check forms as payroll
- Provides bank statement reconciliation

Payroll

- Weekly, Biweekly, Bimonthly, Monthly pay periods
- Complete QTR and YTD Pay Journal records
- Handles hourly, salaried and commission pay
- Sales commissions by percentage or dollar amount
- Only requires input of hours worked
- Automatic calculation of regular and overtime pay and all deductions
- 941A Quarterly State Report
- W-2 Forms printing
- Federal and all State Tax Tables
- Personnel information file
- Uses same commercially available check forms as Accounts Payable
- Comprehensive YTD information printed on employee check stub

Accounts Receivable/ Order Entry

- Alphabetical and numerical sorting of customers
- 500 customers and up to 3000 transactions per 320K diskette (Unlimited number of diskettes allowed)
- Extensive customer information file
- Flags Credit limits and overdue balances
- Invoices from sales orders support backordering system
- Invoices for point-of-sale
- Multiple Price discounts and Sales tax rates
- Sales orders with packing slips
- Supports partial payments, finance charges, aged balances, and statements
- Supports special sales packages [bill-of-material]
- Supplies telephone number and contact name for overdue accounts
- Detailed transaction Audit trail
- Customer Activity Report
- Open Item Balance Forward
- Calculates Sales Commissions for payroll module
- Allows Sales of assets
- Allows sales of non-inventory services

General Ledger

- Chart of accounts
- Itemized monthly Journal transactions
- Asset depreciation, Complete G/L Reports, Daily Journal, Trial Balance, Operating Statement and Balance Sheet
- Supports up to 9 separate Profit Centers

Inventory Control

- Provides ON LINE information to all other modules
- Purchase orders with review or automatic ordering mode
- Complete backordering system included
- 25 items per bill-of-material
- 1500 stock items per 320K diskette with automatic advancement to next diskette
- Complete Vendor information file
- Calculates reorder quantities and displays lead times
- Physical inventory using average cost method adjustments
- Reports in inventory module include: Complete Inventory Report, Sales Analysis, Reorder Report, Purchase Order listing, Sales Package listing, Summary, and Labels



Maxi Accountant is designed for MS-DOS systems, including IBM PC and XT, Zenith Z-100, Victor 9000, Texels Instruments PC, Columbia, Compaq, Hyperion, Corona, Eagle PC, and Rainbow 100.

1-800-327-7172

THE BUSINESS DIVISION

P.O. 3435 • LONGWOOD, FL 32750 • (305) 862-6917



A Subsidiary of Scott Adams, Inc.

CIRCLE 101 ON READER SERVICE CARD

SWIG[®]

SOFTWARE WRITERS INTERNATIONAL GUILD

THE LARGEST PAID MEMBERSHIP PROGRAMMERS GUILD -
OVER 5,000 MEMBERS WORLDWIDE!!

SCHEDULED SWIG ACTIVITIES & MEMBERSHIP BENEFITS

- (1) \$10,000 PROGRAMMING CONTEST (Members only)
- (2) NATIONAL COMPUTER WEEK (March 23-April 1, 1984)
- (3) ANNUAL CONFERENCE AND SOFTWARE AWARDS CEREMONY (During National Computer Week)
- (4) CONSULTANT REGISTRY (With computer store referral system for customized software)
- (5) JOB PLACEMENT SERVICE (Free to individual members, fixed maximum fee to companies)
- (6) FREE SEMINARS & MEETINGS LOCALLY
- (7) SOFTWARE LIBRARY LENDING & EXCHANGE SERVICE (Professional quality assemblers, utilities, games, etc.)
- (8) SOFTWARE LOCATION SERVICE (For companies & individuals-if it exists, SWIG will find it. If not, see #9)
- (9) SOFTWARE DEVELOPMENT SERVICE (From novice to scientist, SWIG members can work on any project-from applications to games to R&D)
- (10) LEGAL SERVICE
- (11) AGENT (SWIG can represent you in sales to software publishers)
- (12) 24 HOUR - 7 DAY BULLETIN BOARD SYSTEM (BBS) ACCESSIBLE BY COMPUTER FREE
- (13) AND MORE!!!!

MEMBERSHIP APPLICATION FOR SOFTWARE WRITERS INTERNATIONAL GUILD

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

PHONE # () _____

• CLASSIFICATION:

- ☐ NOVICE ☐ BEGINNER TO ADVANCED
☐ ADVANCED WITH ON THE JOB EXPERIENCE ☐ RESEARCH/SCIENTIST

• WHAT EQUIPMENT DO YOU HAVE EXPERIENCE WITH &/OR ACCESS TO &/OR PLAN TO BUY?

- ☐ MAINFRAME ☐ MINI ☐ MICRO ☐ DESIGN/R&D
BRAND NAME(S): ☐ IBM ☐ XEROX ☐ APPLE ☐ TI
☐ COMMODORE ☐ RADIO SHACK ☐ ATARI ☐ OSBORNE
☐ TIMEX/SINCLAIR ☐ NORTH STAR ☐ HEWLETT PACKARD
☐ OTHER _____

• AREAS OF INTEREST:

- ☐ DATA PROCESSING ☐ BUSINESS APPLICATIONS ☐ GRAPHICS
☐ LEGAL ☐ VOICE ☐ MEDICAL ☐ APPLIANCE (HOME) CONTROL
☐ ROBOTICS ☐ GAMES ☐ MUSIC ☐ R&D ☐ OTHER _____

• MEMBERSHIP ACTIVITIES AND SERVICES OF INTEREST:

READ THE LIST ON THE LEFT AND CIRCLE THE NUMBERS BELOW THAT APPLY.

1 2 3 4 5 6 7 8 9 10 11 12

- ☐ I HAVE ENCLOSED \$20 ANNUAL MEMBERSHIP FEE ☐ CK ☐ MO
(MAKE CHECK PAYABLE TO: SWIG)

RETURN TO: **SWIG**
P.O. BOX 87
STONY POINT, NEW YORK 10980
(914) 354-5585

SWIG[®] SOFTWARE WRITERS INTERNATIONAL GUILD

CIRCLE 394 ON READER SERVICE CARD

A NEW MODEM
FOR THE IBM PC.



WE COULD HAVE BEEN FIRST; BUT WE'LL SETTLE FOR BEST!

We could have introduced our IBM PC Modem ahead of the competition. But just being first wasn't enough. We wanted to be the best. So after untold hours of nitpicking, analyzing, and re-designing, we've come up with the best fully-equipped modem on the market today. Meet XCOM—the modem that gives you all the features you'll ever need. Don't just take our word for it; compare for yourself.

	XCOM	Smartmodem 1200B	Relay	Bitcomp	HiLink
Features	✓	✓	✓	✓	✓
Internal Mount	✓	✓	✓	✓	✓
1200/300 bps	✓	✓	✓	✓	✓
Auto Dial/Auto Answer	✓	✓	✓	✓	✓
Auto Speed Select	✓	✓	✓	✓	✓
Ring Back Detect	✓	✓	✓	✓	✓
Busy Detect	✓	✓	✓	✓	✓
Dial Tone Detect	✓	✓	✓	✓	✓
Auto Select Touch Tone/ Rotary	✓	✓	✓	✓	✓
Two Year Warranty	✓	✓	✓	✓	✓
Price	\$499	\$599	\$499	\$499	\$499
Software Package	✓	✓	✓	✓	✓

*XCOM includes the industry standard communication protocol CROSSTALK XVI. CROSSTALK XVI includes the following functions: smart terminal emulation, total modem control, data capture, data transmission, and error checked file transfers.

Feature for feature XCOM is way ahead of the rest. And in keeping with our philosophy, we're saving the best news for last. The XCOM modem comes complete with CROSSTALK XVI software for \$449. Sometimes a person has to settle for BEST.

For more information, write or call:

XCOM
3213 Ramos Circle
Sacramento, CA 95827
(916) 366-7071

dump the dumb

Replace your dumb
5251's with smart PC's
or XT's and BLUE LYNX™
for S/34, S/36, S/38

Face it: a dumb terminal is still only a dumb terminal, even when it costs as much as, if not more than a stand alone desk top microcomputer.

Turn your PC or XT into a full functioning 5251 model 12. With BLUE LYNX there is virtually no difference in operating a PC running under emulation from the terminal you're currently using. In addition to getting both online and offline capabilities BLUE LYNX gives you:

■ PC parallel printer support as a 5256 remote printer and color monitor support as a 5292 display.

■ Bidirectional file transfer capability. Optional Emulator Transfer Host Utility (ETU) does ASCII/EBCDIC conversions so that data files of any size will appear to have been created on the target system.

Insert the BLUE LYNX synchronous communications board into any slot in your IBM PC or XT. Load the BLUE LYNX program diskette, give your PC a station address and establish connection. No special host configuration is necessary.

Have a larger IBM mainframe? Techland also offers a 3276 emulation. BLUE LYNX 3276 uses the same synchronous board as BLUE LYNX 5251 and fully supports your printer and diskettes.

Giving your dumb terminal smarts is not expensive. All you need is a BLUE LYNX equipped PC or XT, a synchronous communications device and a communications port on your host system.

BLUE LYNX 5251 - \$690 (per PC/XT)

ETU/34 - \$400*

ETU/36 - \$500*

ETU/38 - \$800* *(one time CPU charge)

BLUE LYNX 3276 for SDLC or BSC environments - \$690

BLUE LYNX 5251/3276 Combination - \$1230

[212] 684-7788

TECHLAND
SYSTEMS INC.

25 Waterside Plaza, NY, NY 10010

When 
**BLUE
LYNX™**
talks,
mainframes
listen!



BLUE LYNX is a trademark of Techland Systems Inc. for its terminal-emulation products for the IBM Personal Computer. IBM is a trademark of International Business Machines Corp.

Software and support by Software Systems, Inc.

CIRCLE 463 ON READER SERVICE CARD

EVEN AN IBM PC NEEDS A SAFETY NET.

Only Alloy's PC-Backup[®] gives you high performance storage/retrieval, and protection — at a lower cost.

Now that the IBM PC comes with a 10 Mbyte hard disk, you need a Backup that can keep up with it. Alloy's PC-Backup is designed to do just that — and it beats flipping floppies every time.

Alloy's PC-Backup works like your business does: it is file-oriented, backing up files in an organized way. It is time and cost efficient too, because it never lets you lose important data.

Designed exclusively for the IBM PC, and small to large businesses, here are some of the features that make Alloy's PC Backup the



finest safety net PC owners could ever require:

- Winchester hard disk backup and restore
- Comprehensive menu driven software package (Alloy's industry standard Tape Interchange Package)
- High speed data transfers
- Up to 16.5 Mbytes of data per cartridge

Also available, Alloy's new 9-track tape drive, for mainframe compatibility.

*Alloy Computer Products
100 Pennsylvania Avenue
Framingham, Mass. 01701
(617) 875-6100*

IBM PC is a registered trademark of IBM Corp. PC-Backup is a trademark of Alloy Computer Products.



CIRCLE 124 ON READER SERVICE CARD

Computer Products



You can hook up your PC to Citibank's HomeBase electronic banking network and pay all your bills without ever leaving home. But before signing up, buyer beware . . .

Home Based Banking

It's Wednesday afternoon, you're booked on a Friday night flight for a 4-week vacation to somewhere over the rainbow, and at work, everything is hitting the fan. You remember that you haven't picked up your traveler's checks—somehow a trip to the bank managed to slip through your best-laid plans. And now, the last thing you want to do is wait on line to sign your name on \$1,500 worth of checks.

So, when you get home, you sit down at your PC and order the traveler's checks for delivery on Thursday. At the same time, you leave instructions to have a couple of your charge bills paid while you're away; you've already set up the payment of your rent and other regular bills. Convenient, isn't it? You, along with several hundred Citibank customers in the New York City area are using HomeBase, an electronic banking network that hooks your PC into the bank's main computer.

Citibank announced availability of its HomeBase banking/financial services program for the IBM PC in August of this year. Now in its third year, HomeBase has been available to Apple and Atari users for some time; it was originally launched on a proprietary terminal provided by the bank

to 200 volunteers. (The bank pulled its terminals once the first machine-specific versions were available.)

Citibank considers HomeBase still to be in the testing stages and is working with users to refine it. Many modifications already have been made based on user feedback. The bank plans to continue its "field test," a spokeswoman said, "until

M_{ANY}
*modifications already
have been made based
on user feedback.*

we've got it to the point that we're certain that this is what the customer wants."

Since the refinement of HomeBase requires substantial one-on-one user contact, as well as a general survey, the bank, for an undetermined period of time, is limiting the number of customers who can enroll in the program. Citibank isn't say-

ing when the testing phase will be over or how many new customers will be added at that time. Once the PC HomeBase network is running smoothly, the bank plans to set up the same system for another personal computer, also on a test basis.

At this point, fewer than 1,000 IBM PC, Apple, and Atari owners are plugged into HomeBase. And, yes, there are waiting lists. But the bank has as many users as it can currently manage in its field-test study.

Your Computer Does the Walking

HomeBase provides full-fledged electronic banking only between your terminal and Citibank, and between your Citibank accounts. It pays out funds from your checking account and receives deposits to all your Citibank accounts in the good old-fashioned way—by mailed checks.

But once you have it up and running, HomeBase does take a lot of the legwork and paperwork out of your banking, bill paying, and financial bookkeeping chores. For one thing, each transaction is immediately recorded, so you can flash it up on the screen. There's no need for you to plow through all that tedious paper work.

Complete and current status information is instantly available on all your Citibank accounts. In addition, you can tell HomeBase you've mailed a deposit, and it will alert you if the check has not been credited to your account within a reasonable period of time. Any activity normally conducted in any of your Citibank accounts can be handled through the HomeBase service.

The main purpose of HomeBase is to pay bills, but it throws in some useful additions. With only one instruction, it will pay such recurring bills as mortgages and rents, and the checks will go out at the appropriate time each month. You even can arrange for HomeBase to pay bills on future dates, so you're covered when you're out of town.

Facilitates Record Keeping

At any given time HomeBase will provide a record of all account activity through the previous 60-day period. You can generate hard copy on your own printer, but the bank sends a monthly statement as well.

But limiting the period to 60 days highlights the fact that HomeBase is not, as yet, a complete service. For income tax purposes, it would be far more useful to have at least the past 15 months at your fingertips. If you're income averaging or taking any depreciations, you'd probably want access to records for at least the previous 5 years.

However, electronic record keeping allows you to call up your Citibank MasterCard and Visa accounts to check on the status of purchases. It also keeps track of those traveler's checks you ordered just before your trip.

Basic Cost Is \$12.50 a Month

The monthly fee for HomeBase is \$12.50, regardless of how many times you access the network. Also available to HomeBase users is the Dow Jones News and Information service. For an additional \$10, it provides current quotes on stocks and bonds, as well as on warrants, treasury bills, mutual funds, and options, plus historical quotes on stocks and warrants. The service also provides general and financial information on some 6,000 American firms. The option doesn't provide everything that's available on Dow Jones, but it focuses on the News Retrieval service, which provides the material most

likely to be of greatest interest to the average customer. It's worth noting that Citibank will automatically provide the Dow

ELECTRONIC

*record keeping allows
you to call up your
Citibank MasterCard
and Visa accounts to
check on the status of
purchases.*

Jones News Service, and will bill you for it, unless you inform them that you don't want it. This information, however, appears on the application in fine print and is easy to overlook.

To be eligible for the service all you need is a Citibank NOW or regular checking account, along with the Citicard, which comes with either one. Obviously, the bank encourages you to partake in its other banking and financial services, which include insured money market accounts, certificates of deposit, and Ready Credit and Checking Plus, each with up to \$25,000 credit lines.

Security Code Protects Users

The Citicard is only one-third of the security system designed by the bank to ensure that only users, end those they authorize, can access their accounts. To get into your HomeBase records, you need three different numbers. One is the code programmed into the disk (or cartridge, for Atari owners) that the bank provides for each user. There's a different number on every disk or tape. The second number is the one visible on the Citicard. The third is the personal identification code, which the user chooses. This number, urges Citibank, should be one that you'll remember without writing down, but it shouldn't be a number, such as your date of birth, which another person could possibly obtain. Even if someone gained access to the other two numbers, he would still need your personal identification number to break into your HomeBase accounts.

In any case, HomeBase protects you; all three numbers must match up.

To find out where we're showing off this P1350 printer, call one of these Toshiba distributors:

COMPU SHOP
1355 Glenview Drive
Richardson, TX 75081
(214) 783-1252

CYPRESS DISTRIBUTING CO., INC.
1266 Lincoln Avenue
Suite 109
San Jose, CA 95125
(408) 297-9900

DIGITAL ENTRY SYSTEMS
27 Spruce Street
Waltham, MA 02154
(617) 898-8111

GENERAL BUSINESS COMPUTERS, INC.
2 North Olney Avenue
Cherry Hill, NJ 08003
(609) 424-6600

GENERAL MICROCOMPUTER
Georgetown Center
52303 Emmons Road #26
South Bend, IN 46637
(216) 277-4872

INTECH GROUP
Royal Commerce Center
2025 Ross Lane
Dallas, TX 75229
(214) 241-1717

KALTRONICS DISTRIBUTORS, INC.
7021 Landry Rd.
Northbrook, IL 60062
(312) 281-1226

MICRO DISTRIBUTORS
11794 Parklawn Drive
Rockville, MD 20852
(301) 486-6400 or
(800) 636-4421

MICROMERICA DISTRIBUTING CO.
17103 Kingsway Avenue
Carson, CA 90746
(213) 327-0030

1050 Remington Road
Schaumburg, IL 60195
(312) 351-1111

366 Washington Street
Wellesley, MA 02181
(617) 431-7680

1461 Exchange Drive
Richardson, TX 75081
(214) 335-3616

MICROWARE DISTRIBUTORS, INC.
20415 N. W. Barton Avenue
Alhambra, OR 97007
(503) 842-7979

MIDTEC ASSOCIATES
6361 Durand Road
Lincoln, NE 68215
(402) 441-1711

MICRO SOURCE DISTRIBUTING CO.
2969 Payne Avenue
Cleveland, OH 44114
(216) 781-6600

PARAGON SALES, INC.
780 Chocoma Avenue
San Jose, CA 95131
(408) 283-7986

PREMIER SOURCE DISTRIBUTING
1882 McGraw Avenue
Irvine, CA 92714
(714) 261-2011

STAR DATA, INC.
4021 N. 30th Street, Suite 4
Phoenix, AZ 85018
(602) 844-4239

SYSPRINT, INC.
7777 S. Central Expressway, Suite 2A
Richardson, TX 75080
(214) 693-3444

TRANSALASKA DATA SYSTEMS, INC.
200 Center Court
Anchorage, AK 99502
(907) 561-1778

...Or these Toshiba Regional Offices:

TOSHIBA AMERICA, INC.
177 Madison Avenue
Post Office Box 2337
Morristown, NJ 07960
(201) 326-6777

TOSHIBA AMERICA, INC.
562 Office Parkway
The Colonnade Building
St. Louis, MO 63141
(314) 591-6761

TOSHIBA AMERICA, Inc.
2555 Cumberland Parkway, Suite 205
Atlanta, GA 30339
(404) 434-3891

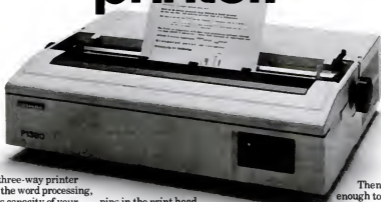
TOSHIBA AMERICA, INC.
18017 Sky Park Circle
Suite 100
Irvine, CA 92714
(714) 290-0181

In Touch with Tomorrow

TOSHIBA



Nothing shows off your IBM PC[™] like Toshiba's P1350 printer.



Now there's one three-way printer that fully equals the word processing, data and graphics capacity of your IBM PC: Toshiba's P1350.

But the P1350 is more than compatible with PC hardware. It will print programs like Lotus 1-2-3 data processing and graphics output with remarkable character definition.*

For even more flexibility, the Toshiba P1350 with Qume SPRINT 5 emulation handles all popular word processing programs. Under software command, the P1350 will print high-speed drafts or switch to letter-quality text and graphics.

The innovation behind this three-in-one flexibility is Toshiba's print head. Pin diameter has been reduced to just eight mils. And the number of

pins in the print head has been increased to 24.

The result is a superior 360 by 180 dot-per-inch density pattern in the text mode. Instead of spinning your wheels at 40 cps, the P1350 produces letter-quality printing at 100 cps. In its draft mode, Toshiba's P1350 can accelerate up to 192 cps.

When it comes to graphics, the P1350 really shows its stuff. Whatever your computer displays, Toshiba's P1350 prints. With astonishingly clear definition. And extra-fine reproduction that can only come from a print head capable of 200 million impressions and exclusive 180 by 180 dot-per-inch graphics density pattern.

Then, if that's not enough to pique your interest, the P1350 also

features three different fonts. Variable pitch. Subscripts, superscripts and underlining without the need of a second pass. A super-reliable, optional sheet feeder. And more.

So show off your IBM. OR ANY OTHER PERSONAL COMPUTER. With the superior quality and flexibility of Toshiba's spectacular P1350 printer.

Distributors on the adjacent list make it easy to find the P1350. Or get more information by calling, toll-free, 1-800-457-7777.

*IBM PC to P1350 graphics utilizes PaperScreen and color graphics adapter. IBM PC is a trademark of International Business Machines Corporation and Lotus 1-2-3 are trademarks of Lotus Development Corporation. © 1983 Toshiba America, Inc.

In Touch with Tomorrow

TOSHIBA

Information Systems Division, TOSHIBA AMERICA, INC.

CIRCLE 592 ON READER SERVICE CARD

If your thirst for technology is combined with an interest in the IBM Personal

A N N O U N C I N G

TECH JOURNAL

FOR IBM PERSONAL COMPUTER USERS

To The Limits... And Beyond

As you well know, the IBM Personal Computer is proving to be the success story of the 1980s. Only 18 months after its introduction, the IBM Personal Computer commands almost a fifth of all personal computer sales—a remarkable achievement. At present the number of IBM Personal Computers in users' hands exceeds a quarter-million, with perhaps as many as half a million on the way in the next 12 months.

But despite its widespread public acceptance and the wealth of products now available to support it, we are convinced that *vast areas of its potential remain unexplored*, not to mention those products waiting to be introduced for which the IBM Personal Computer is the precursor.

For those serious enough about microcomputers to accept the challenge, the IBM Personal Computer represents a host of untapped possibilities.

For those with a genuine appetite for technology, there are ways of stretching the IBM Personal Computer to the very limits of its specifications. Ways to willfully expand those specifications...to throw light into the dark recesses of its complex software systems. Ways to enlarge our understanding of the equipment and to increase its usefulness.

If this sounds appealing, then *PC Tech Journal* is for you. For it will be the definitive source of authoritative, technically-satisfying information about your IBM Personal Computer, its future transformations and the host of products developed to support it.

Why a Technical Journal?

The readership of *PC Magazine* has, in the last year, grown at a rate to match the success of the IBM Personal Computer itself. But as the number of committed readers has expanded, so has that portion of users who are not only interested in *output*—that is, using the IBM Personal Computer to better solve problems—but who care deeply about the *process* of the computer itself.

We consider you to be among that select group of readers. Your relationship

with microcomputers, vocational or otherwise, has led you to levels of technical competence and curiosity which go far beyond problem-solving. In effect, you have a compelling interest not only in *what* your IBM Personal Computer does, but also *how* it does it and *how* it can do more.

For you, technological sophistication is a welcome challenge, perhaps even something of an adventure.

In both its depth and breadth of applicable sophistication, we are confident that you will find *PC Tech Journal* a fitting match for your aspirations.



Computer you will want to take part in exploring its vast technological landscape.

Enroll now as a Charter Subscriber at a special Charter rate ...and get your own copy of our Premiere Issue.

A Select Audience

Needless to say, *PC Tech Journal* is not for everyone. But among *PC Magazine*'s current audience is a sizable segment where *PC Tech Journal* will find an active, committed readership:

Practicing professional developers who will want to read the *Tech Journal* for information they can't find anywhere else.

Serious programmers—both full-time professionals and non-professionals alike—with a clear interest in expanding the range and utility of software compatible with the IBM Personal Computer.

Management and staff serving in MIS and DP roles with a requirement for intimate knowledge of the working processes of their companies' IBM Personal Computers.

Independent businessmen and professionals who understand the increased benefits of tailoring their IBM Personal Computers to their own specific demands.

Members of the scientific and academic community whose ability and training allow them to enhance their use of their IBM Personal Computer.

And, of course, anyone with a genuine appetite for state-of-the-art information about the emerging possibilities presented by the IBM Personal Computer.

A Menu for Technical Gourmets

Under the leadership of Editor-in-Chief Will Fastie, author of the widely respected "IBM Images" column in *Creative Computing Magazine*, we've assembled a staff and a stable of regular contributors all with just the sort of demonstrated expertise you'd expect from *PC Tech Journal*.

Every bimonthly issue will be filled with useful articles on subjects such as...

- How to fully exploit—or, if necessary, avoid—the complexities of BIOS, the IBM Personal Computer's installed firmware.

- Detailed examinations of component hardware available for the IBM Personal

Computer, including multi-function cards, display devices, laboratory data acquisition equipment and voice recognition and synthesis devices.

- Elegant programming methodologies which exploit the IBM Personal Computer's various operating system environments, plus reviews of new operating environments.

- Evaluation of the IBM Personal Computer's communications protocols and standards, including a detailed discussion of computer-to-computer interconnection, terminal emulation and distributed data processing.

- Plus a range of articles on networks, mass storage and important user development tools.

Moreover, as *PC Tech Journal* evolves, it is our explicit

intent that you, our readers, play an important part in shaping the magazine. For we are convinced that it will be you who shape the future usefulness of the IBM Personal Computer itself.

To that end, we will make a special effort to involve you in the focus of the magazine, listening to your needs and together forging workable technical solutions to fully take advantage of IBM's revolutionary Personal Computer.

Charter Subscription Offer

Just fill in and mail the coupon or the attached card. We'll enroll you as a Charter Subscriber, send your Premiere Issue and bill you at the special introductory price—a discount of up to 33% (based on the full one-year subscription price.)

PC TECH JOURNAL
P.O. BOX 2966 Boulder, Colorado 80322

8H161

☐ Yes Please enroll me as a Charter Subscriber to *PC Tech Journal*

☐ One year (6 issues) only \$19.97—20% off!

☐ Two years only \$36.97—26% off!

☐ Three years only \$49.97—33% off!

Savings based on full one-year subscription price of \$24.97

CHECK ONE ☐ Payment enclosed ☐ Bill me later

Mr/Mrs/Ms _____ (please print full name)

Company _____

Address _____

City _____

State _____ Zip _____

Announcing...

4-5-6 Spreadsheet Templates

\$29.95

Used with 1-2-3™ Replaces the costly software of the past.



- **4-5-6 Spreadsheet Templates...** maximize the full power of 1-2-3 without the drudgery of learning commands you'll only use once.
- **4-5-6 Spreadsheet Templates...** save you time by making the IBM PC™ with your 1-2-3 programs, ready to run...NOW!
- **4-5-6 Spreadsheet Templates...** are so easy to use that all you do is fill in the blanks 4-5-6 does the rest.
- **4-5-6 Spreadsheet Templates...** are professionally designed for small businesses and personal finance and are comparable to BASIC programs costing 10 or 20 times more.

What are Spreadsheet Templates?

Interactive programmed models stored on diskettes that when loaded into 1-2-3, replace software programs written in BASIC. The templates are menu driven with automated functions for ease of operation.

4\$5\$6

Send Check, Money Order, or Credit Card # to
Software That Counts, Inc.
 528 N. Milpas St., Suite 456, Santa Barbara, CA 93103
 Or Call (805) 962-6328

Caveat Emptor

It can be argued, however, that voice-print identification would provide even greater security. It doesn't take the imagination of high-school student computer-whiz David Lightman (in the current bit movie *Wor Games*) to think of the ways intruders can access accounts from electronic terminals, whether electronic teller machines, home computers, or whatever electronic banking technology the future may bring. With many banks now developing electronic banking programs, security problems conceivably could reach epic proportions.

There's reason for concern on the part of consumers, since under the Electronic Funds Transfer (EFT) Act and Regulation E of the Federal Reserve Board, users of EFT procedures have less protection from, and potentially more liability for, error and theft than those using conventional banking services. Virtually the only time a customer is not liable for at least some part of the loss is in the case of an unauthorized transfer by a bank employee. And, unless you check your account status every day, you can never be sure that it hasn't been tampered with. In conventional banking transactions, where you actually sign a check taken out of your checkbook, the general thrust of law end practice is that if

EVEN IF
 someone gained access
 to the other two
 numbers, he would still
 need your personal
 identification number to
 break into your
 HomeBase accounts.

the bank pays a forged check out of your account, it is liable, not you, the consumer. The bank is supposed to check the signature. But when the check goes out directly from the bank, via an electronic banking network, you lose the level of protection provided by the paper itself.

Add to this the relative fuzziness of many definitions and provisions of the

4-5-6 PROGRAMS	Order #	Price	Quantity Ordered	Extended Price
4-5-6 Personal Organizer	123456 - 1	\$29.95		
4-5-6 Personal Bookkeeping	123456 - 2	\$29.95		
4-5-6 Payroll*	123456 - 3	\$29.95		
4-5-6 Accounts Receivable	123456 - 4	\$29.95		
4-5-6 Sales Order Entry*	123456 - 5	\$29.95		
4-5-6 Inventory Control*	123456 - 6	\$29.95		
4-5-6 Accounts Payable*	123456 - 7	\$29.95		
4-5-6 General Ledger*	123456 - 8	\$29.95		
4-5-6 Mailing List	123456 - 9	\$29.95		

Card # _____ Amount for Programs \$ _____
 Exp. Date _____ California Add 6% \$ _____
 Signature _____ Add Shipping \$ 1.00
 Payment Enclosed \$ _____
 Check One: ☐ Charge my:
☐ American Express ☐ MasterCard ☐ Visa
☐ Please send me a FREE 4-5-6 Catalog immediately.
 Name _____
 Street _____
 City _____ State _____ Zip _____

*All 4-5-6 Accounting Templates Comply with Standard Accounting Principles.
 IBM PC is a trademark of IBM Corp. 1-2-3 is a trademark of Lotus Development Inc.
 4-5-6 is a trademark of Software That Counts Inc.

REQUIREMENTS: IBM PC XT LOTUS 1-2-3 -1A

CIRCLE 534 ON READER SERVICE CARD

law and that electronic banking is so new that there's little history to go by. Consumers considering using the latest in up-to-date home banking should probably take caveat emptor very seriously.

Necessary Hardware

Aside from the Citicard, the only other requirements are certain pieces of your PC system. HomeBase requires 48K RAM and

CAN HOMEBASE be used with IBM compatibles? Citibank's answer is a reluctant "probably."

an asynchronous communications adapter, with an RS 232 interface. Citibank's disk drive specs call for a single-sided drive (160K) or a dual-sided drive (320K) with an appropriate disk drive adapter, and either DOS 1.0, 1.1, or 2.0. For auto-dialing, you need a DC Hayes Smart modem, an autodialing Novation AutoCat with a modified cable connection, (pin 4 wired to modem pin 25), or any RS 232 Bell 103 compatible, 300-baud full duplex only, and manual dialing only. Monitor and printer choices are up to you.

A final question: Can HomeBase be used with IBM compatibles? Citibank's answer is a reluctant "probably." But the bank's contract is with IBM, not with Compaq, Hyperion, or Eagle. So, if a potential HomeBase user applying for the service happens to let it slip out that he's got a compatible, and not the PC itself, well...

The Wave of the Future

When Citibank perfects HomeBase with the help of user feedback, it will lift its limited enrollment and begin a test-condition period with other personal computers. Other major commercial banks soon may offer this service, too. Clearly, electronic banking is the wave of the future, but before you opt for home-based banking, remember that the waters are still untested. It's an area where changes are called for in order to provide greater customer protection. /PC



"Your Portfolio, Sir?"

The DOW JONES INVESTMENT EVALUATOR[™] is computer software that serves your personal investment needs at home—accurately and efficiently.

A Personalized System

With the INVESTMENT EVALUATOR, your home computer and a telephone modem, you have a personalized system for managing your portfolio. A system that automatically updates and tracks only those stocks you want to follow—allowing you to evaluate your position at a glance.

Easy Access to News/Retrieval

This software automatically dials and connects you with Dow Jones News/Retrieval[®], the world's leading supplier of computerized information on demand. It allows you and your family access to current quotes, financial and business news, general news, movie reviews, sports, weather and even the Academic American Encyclopedia.

The Right Amount of Software for the Job

The INVESTMENT EVALUATOR gives you the capabilities you need without making you pay for a lot of complex functions you may never use. Menu screens lead you to what you want with one-touch commands. The program is completely reliable, comes with an easy-to-follow manual and is fully supported by the Dow Jones Customer Service hotline.

From Dow Jones, Publishers of The Wall Street Journal

Dow Jones has been serving the business and financial communities for 100 years. Now Dow Jones Software[®] serves you at home.

For a free brochure call:
1-800-345-8500 ext. 262

(Alaska, Hawaii and foreign call 1-212-700-7000 ext. 262)



DOW JONES SOFTWARE

Dow Jones Investment Evaluator[™]
...Bank on it.

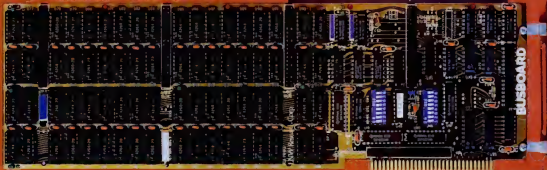
Available for Apple II, Apple IIe,
IBM PC and XT Professional
Compatibility with Atari and
Commodore to follow.

Copyright © Dow Jones & Co., Inc., 1982. All Rights reserved.

THE ULTIMATE SOLUTION TO THE PC EXPANSION DILEMMA.

Every owner of an IBM PC, PC II, PC XT or PC compatible computer has a terrific personal computer, and one great big problem. With all the different peripheral applications and functions available today, how do you take maximum advantage of your computer when your computer gives you so few expansion slots to take advantage of?

Until now there has been one basic solution with a multitude of ingenious, yet ultimately unsatisfactory variations. You could, in effect, increase your expansion capability by buying a single circuit board configured with a super, maxi, ultra, mega collection of functions and applications built right into it.



The only difficulty with that approach, though, is that you end up getting the solution to somebody else's problem. What happens when you want a different set of peripherals than is commonly asked for? Either you don't get what you want, or you end up getting—and paying handsomely for—a bunch of unwanted circuits. And then what happens if you decide to add a function later on? or your computing tasks change? or a new peripheral becomes available? Every option you have will cost you a bundle.

THE BUSBOARD™ SOLUTION

Now from LNW Computers comes the perfect solution—a circuit board so versatile that it comes with 84K of built-in RAM (expandable to 512K) and the ability to accept up to eight different peripheral modules in easy plug-in design. We call it the Busboard™, and you'll call it the answer to every expansion dream you've ever had.

With the Busboard™ you'll be able to design an expansion board with the specific solutions to your specific problems. You can add a single coprocessor and 6 I/O devices, or up to 8 separate I/O devices on a single board. You won't have to pay for functions you don't want, and you can buy additional modules as you need them or can afford them. You can take modules off or add them on, and you'll never have to worry about obsolete boards when new functions become available. Your Busboard™ will always be able to accept the latest innovations in new product design.

And, because the Busboard™ is modular in design and construction, it costs a lot less than you might otherwise expect. You'll be amazed when you figure out the cost of a Busboard system custom-designed for your needs versus a preconfigured card designed for somebody else's needs.

The Busboard™ from LNW Computers.

When you look at your needs today and tomorrow, there just isn't any other intelligent choice.

IBM is a registered trademark of IBM Corporation. CP/M, CP/M PLUS, and CP/M-86 are registered trademarks of Digital Research, Inc. MSDOS is a registered trademark of Microsoft Corporation. Xerox is a registered trademark of Xerox Corporation. HP is a registered trademark of Hewlett Packard. Kaypro is a registered trademark of Kay Corporation. Osborne is a registered trademark of Osborne Computer Corporation. Tandy is a registered trademark of Tandy Corporation.

Busdrive™
Spoolbus™

LNW SOFTWARE

Busboard™

Allows for addition of I/O devices and additional processing power through coprocessor BUS. Can be used for slave, multi or compatible processing. Busboard comes complete with 84K of parity checking RAM and is fully expandable to 512K RAM in 84K plug-in increments. Maximum expansion to 704K allows for emulation of entire dual-sided disk drive, spooling of lengthy documents to RAM and full use of CP/M PLUS™ adapter card. Busboard™ also comes with BUSDRIVE™, a high performance disk drive emulator, and SPOOLBUS™, a multi-printer, auto/manual queuing printer spooler. Both diskettes are MSDOS™ (PCDOS) and CP/M-86™ compatible. **Suggested retail \$349.95.** RAM-less Busboard™ is available without coprocessor slot and RAM. Can be used exclusively for I/O module expansion. **Suggested retail \$129.95.**



LNW801™ CP/M PLUS™ Coprocessor Module. Z80A microprocessor based module allows running of programs under CP/M PLUS™ operating system as well as old CP/M® 2.2 system. Allows PC to run extensive library of CP/M® programs compatible with LNW801™ Model II computer from LNW Computers and computers from Xerox® HP® Kaypro® Osborne® Tandy® and others. CP/M® system supports 3½ Floppy disk (occupies 2 module slots). **Suggested retail \$249.95.**



Asynchronous Communication I/O Module

Can be programmed as standard IBM COM 1 and COM 2 channels, or can be set to 13 additional unique addresses. This allows each Busboard™ to contain up to 8 separate serial asynchronous channels with a total of 16 different channels. Can be configured as DTE or DCE. **Suggested retail \$79.95.**



Floppy Disk I/O Module.
Replaces disk controller in PC and provides interface for both 5" and 8" disk drives. 8" operation allows compatibility with diskettes from other CP/M-88™ and CP/M systems. 8" drives also increase disk capacity to 4.5 Mbytes and speeds up disk drive operation.
Suggested retail \$169.95.



Auto-Answer, Auto-Dial, 300 Baud, Direct-Connect Modem I/O Module.
Features auto-answer and auto-dial in tone or pulse to allow use of low cost, long distance services. Program listing supplied allows for smart modem under BASIC. Speed dialer program included. (First delivery pending FCC registration)
Suggested retail \$149.95.

EASE OF USER INSTALLATION



The Busboard™ was designed for ease of installation and reconfiguration. Modules simply plug in and out by hand and require no special installation procedures.



Parallel Printer I/O Module.
Interface can be set for LINE PRINTER 1 or LINE PRINTER 2 port addressing. Can also be set for optional LINE PRINTER 3, or can be used as simple, general purpose 8-bit I/O port.
Suggested retail \$49.95.



Clock/Calendar I/O Module.
Crystal controlled clock/calendar keeps track of time in hours, minutes and seconds, and features a complete calendar with the year, month and day with automatic leap year compensation. Supplied with software to operate in both CP/M-88™ and MS-DOS™. Also includes back-up battery and Alarm function.
Suggested retail \$69.95.



Game I/O Module.
Connects to any IBM compatible joystick or paddle and is compatible with IBM PC game I/O card. Allows for connection of 4 buttons and either 2 joysticks or 4 paddles.
Suggested retail \$49.95.



16 Channel Analog Input A/D I/O Module.
Instrumentation module features 16 independent multiplexed analog input channels with 8 bits of resolution per channel.
Suggested retail \$109.95.



8 Bit I/O Module.
Provides for latched 8 bits of output and an optionally latched 8 bits of input with interrupt capability fully supported. Port addressing is user programmable for up to 8 modules per Busboard™.
Suggested retail \$59.95.



Prototyping I/O Module.
Utilizes 3M Scotchflex Breadboard prototyping system, and allows for rapid development of prototype products for the IBM PC. Comes complete with 40 conductor I/O BUS connector and an assortment of prototyping pins.
Suggested retail \$29.95.

NEW BUSBOARD™ MODULES

In order to give you the greatest degree of custom-design flexibility, LNW Computers will be releasing new Busboard™ modules reflecting both the latest technological innovations and the most practical function applications. The following is a sample of the modules scheduled for release in the months ahead:

- Short Busboard (Shortboard) for the XT and newer PCs
- 8088 Coprocessor Module
- EPROM Programmer I/O Module
- Speech Synthesis I/O Module
- D/A Converter I/O Module
- Network Controller I/O Module
- Synchronous Communication I/O Module
- Relay Control I/O Module
- Hard Disk Controller I/O Module
- IEEE488 Interface I/O Module
- BSR X10™ Controller I/O Module
- DTMF (Touch Tone™) Decoder I/O Module
- External Connector Mounting Bracket

All Busboard modules and accessory products are available at leading computer stores nation-wide. For more information or the dealer nearest you call, 714/544-5760.



LNW COMPUTERS

2620 Walnut, Tustin, California 92680

CIRCLE 393 ON READER SERVICE CARD

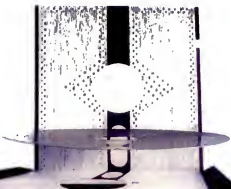
BASF QUALIMETRIC™ FLEXYDISKS® BUILT FOR ETERNITY - WARRANTED FOR A LIFETIME.

BASF Qualimetric FlexyDisks® offer you more...an extraordinary new lifetime warranty.* The BASF Qualimetric standard is a dramatic new international standard of quality in magnetic media...insurance that your most vital information will be secure for tomorrow when you enter it on BASF FlexyDisks today.

We can offer this warranty with complete confidence because the Qualimetric standard reflects a continuing BASF commitment to perfection...a process which begins with materials selection and inspection, and continues through coating, polishing, lubricating, testing, and 100% error-free certification. Built into our FlexyDisk jacket is a unique two-piece liner. This BASF feature traps damaging debris away from the media surface, and creates extra space in the head access area, insuring optimum media-to-head alignment. The result is a lifetime of outstanding performance.

When your information must be secure for the future, look for the distinctive BASF package with the Qualimetric seal. Call 800-343-4600 for the name of your nearest supplier.

CIRCLE 136 ON READER SERVICE CARD



ENTER TOMORROW ON BASF TODAY



BASF

*Contact BASF for warranty details.

© 1982, BASF Systems Corporation, Bedford, MA

This One Decision Saved our Business and Grossed over \$1,000,000. in Sales

In 1979, our recreational manufacturing business was booming. And we had developed a new product that looked like a real winner. The new product was extremely important, in that it appeared to be the answer to a seasonality problem associated with our other product lines.

By early summer, our order book was bulging. It really looked as if our off-season sales and production problems were over. Then just as quickly the roof fell in. Gas shortages devastated the recreational vehicle market overnight. And our order book for over two million dollars worth of the new product disintegrated.

Faced with a fall and winter of virtually no sales, many thousands of dollars of unneeded parts and excess production staff, I had no choice but to shut down the production lines. And if a solution to our problem couldn't be found, the business itself was in jeopardy.

A life saving decision

I spent many sleepless nights trying to come up with a solution to this nightmarish situation. Then I remembered a course I had taken in decision analysis. I spent the rest of that night reviewing course material and other books I had bought on the subject. The next day, I called an emergency meeting. Using the decision making techniques I had learned, we spent the rest of the week searching for and analysing potential solutions. The net result was that not only was the company pulled back from the brink of destruction, but we added over \$1,000,000.00 in gross sales during that off-season.

A way of life

From that point on, almost every critical decision (and there were many) regarding new products, marketing channels, pricing, advertising, production equipment, engineering projects, received this same type of analysis.

Although the process was very time consuming and clumsy, because it had to be done by hand, our decisions were much improved. And there were some real benefits that we had not anticipated.

1. Our understanding of each problem was greatly increased.
2. We uncovered opportunities that we would not have thought of in any other way.
3. Our decisions were documented, preventing us from slipping off the selected path or 'rehashing' the same things over and over.
4. Consensus became easier because we were forced to focus and resolve each part of the problem, one piece at a time.

The birth of Decision-Analyst™

Decision-Analyst was created because the process of evaluating complex decisions with multiple alternatives and many criteria is very tedious and time-consuming if you do it on paper. And doing it in your head is virtually impossible.

Any complex decision usually requires multiple revisions to criteria, alternatives, weights and values assigned to them. If done

manually, the ordeal of rewriting, recalculating and redocumenting tends to discourage revisions, thus producing poor results.

Decision-Analyst overcomes these problems by asking for the minimum input possible from you, in the correct sequence. It leads you step by step through the decision making process, then does all the necessary calculations and produces polished reports without any further effort. And all of your input is stored on your disk so that revisions and updates can be made easily at any time.

Comprehensive but easy to use

Decision-Analyst is probably the easiest program you'll ever use. You can literally learn to operate the program using only the 'help' screens. But it comes with a thoroughly indexed manual which includes many pages of examples plus a step by step guide to the decision making process.

And Decision-Analyst is no fly-weight. It uses over 100,000 bytes of fast compiled code and a 40,000 character help file. The program is extremely 'bullet proof' and does all the work... you do the thinking. And there is no danger of missing a critical step because your analysis is guided through each of the eight menu-driven sections.

Endless opportunity for use

If you're saying to yourself that you really don't have any earth shattering applications for

Decision-Analyst... then consider this. If you're in business, chances are that the most important thing you do is make decisions.

Decision-Analyst can help you select key personnel, decide on new machinery or equipment, prioritize major projects and allocate resources, choose a new product or a better price strategy, select new offices or plant locations, select the most profitable marketing channel or the best piece of computer hardware or software. Use it to analyse any decision which has more than one viable alternative.

In your personal life, it can help you choose the best job, select the right business, career or franchise, determine the best field of investment or even the right home, boat or car. In fact, improving your decisions is probably the most rewarding thing you can do.

Let us help you make a \$139⁰⁰ decision

If there's a chance that Decision-Analyst could help you improve even one decision, would it pay for itself? Chances are it would. In fact, it's likely that it could save you the price many times over!

So why not take advantage of this special \$139.00 introductory price (plus \$5.00 shipping) by calling us today? We'll even refund your money, within 30 days, if you're not completely satisfied.

Available for virtually every make of micro-computer using CP/M, CP/M-86, MS-DOS or PC-DOS operating systems. Requires an 80 column screen and an 80 column printer for reports.



Executive Software Inc.

Call Collect
(705)722-3373

U.S.A.
Executive Software Inc.
Dept #1033
Two North State St.
Dover, Delaware
19901

Canada
Executive Software Inc.
Dept #1033
14 Green Pine Ave.
Barris, Ontario, Canada
L4M 4S5

Great Britain & Europe
Microcomputer Products
International Ltd.,
Central House,
Cambridge Rd, Barking
Essex, England IG11 8NT

™ Decision-Analyst is a Trademark of Executive Software Inc.

® MS-DOS is a Registered Trademark of Microsoft Corp. • CP/M • CP/M-86 Registered Trademarks of Digital Research Inc. • PC-DOS is Registered Trademark of IBM

COMPUTER OUTFITTERS

We sell only the finest products and only for IBM Personal Computers, butWHY CALL US?

Here's Why:

- We can provide Technical Support, BEFORE and AFTER you buy!
- We have the BEST PRICES you're going to find. If we change prices, it's usually to make them lower!
- We have NO SURCHARGE for Visa or MasterCard!
- We charge only \$2.00 per item for UPS Surface!
- We charge only \$3.00 per ORDER for UPS Blue Label!
- We ship the SAME DAY if humanly possible!
- We accept COD's for only \$5.00 (Cash or Certified Check)
- We STOCK what we sell and all products have MANUFACTURERS WARRANTIES!
- We charge NO SALES TAX except in Texas! (5% on Hardware only)



SPECIAL

Information Unlimited's
EasyFiler \$205.00

- Up to 10,000 records or 50MB of Hard Disk
- Up to 1,000 Characters per Record.
- Fields may have up to 255 Characters.
- Up to 50 Fields per Record.
- Automatic Insertion of Repetitive data
- Up to 10 KEY Fields.
- Keys can be defined as Unique, Duplicate or SOUNDEX (Allows for misspellings)
- Field Definitions may be changed.
- Extensive Field Editing capabilities.
- Report Generator can produce Screen, Disk or Printer output - Reports, Labels Letters and Basic Files.
- Sort by up to 5 fields simultaneously

AST RESEARCH

All AST Boards include SuperDrive and SuperSpool!

MegaPlus II : 64K Memory Standard (To 512K)

\$260.00	1st Serial Port Standard
*****	Clock/Calendar Standard
	Options: Parallel Port \$ 35.00
	2d Serial Port \$ 35.00
	Game Port \$ 35.00
	64K Upgrades \$ 60.00
	MegaPak \$265.00

SixPak Plus: 64K Memory Standard (To 384K)

\$260.00	Serial Port Standard
*****	Parallel Port Standard
	Clock/Calendar Standard
	Options: Game Port \$35.00

Ask us about other AST products. We can help.
New products are being announced regularly.

MANNESMANN TALLY Printers Please ask us about the MT 160L, MT 180L (Wide Carriage) and the NEW Spirit

VisiCorp

VisiCalc with StretchCalc	\$ 160.00
VisiCalc: Advanced Version	\$ 260.00
VisiCalc Business Forecast	\$ 65.00
VisiWord	\$ 250.00
VisiSpell	\$ 150.00
VisiWord with VisiSpell	\$ 285.00
VisiFile	\$ 190.00
VisiSchedule	\$ 190.00
VisiTrend/Plot	\$ 190.00
DeskTop/Plan	\$ 190.00
VisiLink	\$ 165.00

PCSoftware

CREATABASE	\$ 60.00
CHAMPIONSHIP	
BLACKJACK	\$ 30.00
PCorayon	\$ 32.50
PCfootball	\$ 38.00

Fox & Geller

(For MSDOS)

Quick Code	\$ 200.00
dGraph	\$ 200.00

Information Unlimited Software

EasyWriter II	\$ 185.00
EasySpeller II	\$ 110.00
EasySpeller 1.1	\$ 60.00
EasyFiler	\$ 205.00
EasyPlanner	\$ 115.00
EasyMailer	\$ 130.00

*** IUS Sets ***

EW II, ES II, EF and EP	\$ 575.00
EW II, ES II, and EasyMailer	\$ 400.00

ASHTON-TATE
BEST PROGRAMS
LOTUS DEVELOPMENT
SOFTWARE SYSTEMS

dBASE II	\$ 400.00
Personal Finance Program	\$ 65.00
Lotus 1-2-3	Please Call
Multimate	\$ 300.00

PETER NORTON
MICROSOFT

Norton Utilities	\$ 55.00
MultPlan	\$ 175.00
Flight Simulator	\$ 35.00

*** MICROPRO ProPack: WorkStar, SpellStar, MailMerge and Star Index \$ 425.00 ***

COMPUTER OUTFITTERS

In Texas call: 915/581-5463 404 Balboa Toll Free: 800/351-1026

WordPerfect spins off a new model, Personal WordPerfect, that duplicates many of the features of the original at a significantly lower price.

WordPerfect Gets Personal

Personal WordPerfect

Satellite Software International
288 W. Center
Orem, UT 84057
(801) 244-8554

List Price: \$195

Requires: 128K RAM, two disk drives, any 80-column display.

CIRCLE 615 ON READER SERVICE CARD

Personal WordPerfect is a new entry in the word processor sweepstakes, one that is aimed at the entry-level IBM PC user. New may be the wrong term to use, however, as Personal WordPerfect is really just the younger sibling of the more powerful Satellite Software International (SSI) product, WordPerfect. As such, Personal WordPerfect boasts most of the significant characteristics of WordPerfect at a considerably lower price.

For someone who uses WordPerfect regularly, the tendency to compare the two products is almost overwhelming, but any comparison should take into account the \$300 price difference. Personal WordPerfect nevertheless holds its own in such a comparison, even though a number of

the powerful features from WordPerfect have been excised.

Getting Started

Personal WordPerfect (hereinafter PWP) comes not in the now-familiar three-ring binder end slipcase but in a spiral-bound manual that lays flat when opened. The disk envelope affixed to the last page of the manual contains one single-sided, 160K disk. Also provided are a paper template to surround the ten function keys and some slips of paper with update information. The slips indicated that Version 2.30 of the program was enclosed and provided some guidelines regarding IBM-DOS 2.0 and the use of a color display. A short, simple, and easy-to-understand "License Certificate" form also is included. Once the two-part form has been filled in, the second copy, actually a prepaid postcard, is mailed to SSI.

The manual is typeset, clearly written, and well formatted and organized. It covers the basics of word processing with PWP; how to get help; and the typing, editing, formatting, printing, and filing of documents. The last chapter explains how to install and run the program. It might have

been better to place the start-up information at the beginning of the book, since one logically might expect such matters to be of immediate interest to a new user.

One vital area of information is missing: nowhere does the document clearly state what hardware configuration is required to run PWP! The answer: 128K of memory, two disk drives (it will work on one drive and an electronic disk), and any 80-column display.

Two versions of the program are supplied. One incorporates a feature that SSI calls "Flash." When used with the IBM monochrome display, this version offers much more rapid screen display than the standard version. If a color display or an IBM-compatible computer is being used, the standard version is required.

Two batch files are included on the disk to facilitate setup of a PWP working disk. MAKE.PWP.BAT sets up the standard version, while MFFLASH.BAT sets up its namesake. Unfortunately, the Version 2.30 of the documentation reviewed here did not explain the use of these batch files, and although the published setup procedure will still work, it will leave unnecessary files on the working disk.

Once a working disk has been prepared, the program is invoked with the DOS command PWP. It is also possible to enter a system configuration menu by giving the command PWP/S. In this case, a number of default settings can be established or a previous set of defaults changed. Again, the documentation provides a slightly different explanation of this process, and does not mention the PWP/S option. One of the slips of paper does mention /S, but the reference in these instructions is to WordPerfect, not PWP, a source of possible confusion.

These flaws in the document are unfortunate, because the manual is a definite improvement over previous SSI efforts. A misunderstanding of the setup instructions, though not fatal, is certainly frustrating. This oversight is likely to alienate many prospective PWP users—a tragedy, since nearly everything else about PWP is good!

Online with PWP

When the program is finally running, the user is presented with a blank screen, except for a message in the lower right-hand corner showing the page, line, and column position of the cursor. PWP uses a flashing underscore to display the cursor, which is initially in the upper left-hand corner of the screen. At this point, the user simply can begin to type.

The first page of the manual explains the opening screen display and gently nudges the user into action with a simple, three-line typing exercise. The next 2 pages teach the user how to move the cursor, how to delete text, and how to add text. Page 4 explains how to print. Pages 5, 6, and 7 explain how to save and retrieve text and how to exit the program.

If that seems short, it is. The entire first chapter can be read in five to ten minutes. Chapter 2 is about the Help key, and what to do if you type something wrong; each topic is treated in one page. The rest of the manual follows the sequence laid out in the first chapter: typing, editing, formatting, printing, and filing.

Help

One of the nicest features of PWP is the built-in help feature. It is invoked by depression of a function key and displays the message "Help with what?" The proper response is the depression of any key. If the key pressed is the Help key, or a key

that is meaningless to the program, PWP explains how to use the Help key properly. If a function or cursor key is depressed, information on its use is displayed.

The information displayed is quite complete. When I first used WordPerfect several years ago (on Data General equipment), the SSI documentation was complete, but terribly written and almost impossible to use. By reading the manual, I learned how to use the Help key. Then I used the Help key to learn how to use the program. I recommend that PWP users take the time to request Help on every key on the keyboard (including the Ctrl, Alt,

C HANGING *the disk default does not accept PWP's ability to find its own files.*

and Shift combinations). Although this might seem tedious, there are a few omissions in the manual that are explained by Help. This is balanced by a few omissions online that are explained in the manual. (For example, the use of the left and right cursor keys with the control key is not explained.)

Typing, Editing, and Printing

In my experience, the first-time user wants to get something typed and see it printed. Personal WordPerfect makes this almost painless.

Entering text is easy. Once the initial screen has been displayed, you simply can type away. Naturally, PWP will wrap at the end of lines. Editing text is just as easy. You position the cursor, use either of the delete keys to delete text, and type to insert new text. The program is in insert mode to begin with; this means that anything typed will be placed at the cursor, and text to the right of the cursor will be displaced to the right.

Moving the cursor in PWP is a dream. SSI has devised the finest, most elegant navigational scheme around. The cursor keys have the expected effect: they move one unit left, right, up, or down. The horizontal units are characters, and the vertical units are lines. If the cursor depression is prefixed with a Home key, the cursor

will move to the appropriate edge of the display screen. If two Homes are typed, the cursor will move to the appropriate edge of the document (that is, the beginning or end). As if that were not enough, the Esc key can be used as a prefix to move the cursor eight units, and the Ctrl key can be used with the right and left arrow keys to move the cursor word by word. But wait... there's more! There is a Goto key (Ctrl-Home) that can be used with the up and down arrow keys to move the cursor to the top or bottom of the current page. Or, the Goto key can be followed by a number, in which case the cursor will move to the top of the page of that number. It can also be followed by some other character, in which case the cursor will move forward to the first occurrence of that character. (The cursor does not move if the character cannot be found.)

The PgUp and PgDn keys on the PC are used for those functions by PWP, positioning the cursor at the top of the previous or the next page, respectively. The minus and plus keys on the far right of the IBM keyboard move the cursor to the top or the bottom of the screen; they have the same function as the up or down arrow prefixed by one Home, but they are easier and quicker to use.

That may seem like quite a bit to remember, but it takes only a little practice to train one's right hand. Once learned, navigation is hard to forget, an important advantage.

Printing is the one rough spot for the beginner. The main reason is that the manual refers to a key called Print, but nowhere on the keyboard (or the SSI template) can such a key be found. The key in question is the IBM's PrtSc key, used in conjunction with the Ctrl key. If you experiment with Help, you will find the key. It also can be found if you refer to the chart on the inside front cover of the manual, which gives the IBM designation for all Personal WordPerfect key assignments.

Also, attempts to print before printer definitions have been established will fail, although PWP does explain what you must do to recover. It is possible to redefine the printers from within the program, a delightful feature, and one I think might be unique to SSI products.

PWP claims one very powerful printing feature. Unlike many word processors in its price range, it prints in the back-



PCOX™ LOVE TO TURN PC'S INTO THINGS OF BEAUTY.

PCOX. The beautiful interface to turn your PC's into fully functioning, intelligent work stations. PCOX are the high-performance PC-to-host system connections. Just drop one into a PC slot, and you're ready to go, without any host system or application software changes.

The PCOX package integrates both your software and hardware. It's easily attached by coaxial cable to your IBM

3274/76 cluster controller for perfect 3278/9 emulation. PCOX are the fast, simple, cost-effective way to integrate your PC's into IBM host networks.

With our efficient PCOX, you enjoy full screen capability—with no jerking, flickering or waiting. And PCOX offers an optional utility giving you menu-selected file transfers between your PC and the host system.

For all the attractive details about how the PCOX can brighten your life, simply contact us today.



**"ADD UP TO 512K RAM, ASYNC AND
SYNC COMMUNICATIONS, A CLOCK
AND PRINTER SUPPORT-UP TO FOUR
I/O PORTS IN JUST ONE SLOT?"**



"YOU CAN WITH PERSYST."

The Persyst Time Spectrum. It's the most powerful and expandable multi-function PC board you can buy.

A Persyst Time Spectrum™ multi-function board can make any personal computer work better.

Whether you own an IBM PC or XT. Or the IBM compatible Compaq or Columbia.

There's even a Time Spectrum board for the Texas Instruments PC.

With Time Spectrum, you can combine up to six powerful functions—plus two advanced software programs—on just one board. And get performance and features like nothing else.

For the IBM PC, Compaq and Columbia, maximum capability in minimum space.

For example, Time Spectrum is the only multi-function board that lets you expand your IBM PC from 64K up to 512K RAM. Add a calendar clock. Add as many as two RS-232 asynchronous communications ports, or two synchronous and one asynchronous communications port. Plus print spooling and as much as 320K of RAM disk memory.

Up to four I/O ports—in just one slot.

How did we do it?

With the Cliffhanger™. A unique, RFI-shielded connector system that solves the problem of tying two or more I/O ports to peripheral equipment like a printer or modem, without consuming two or more slots.

And only Persyst has it.



The Time Spectrum Cliffhanger™
So ingenious, it's patented.

What's more, expansion functions can be plugged right onto the Time Spectrum board. Or added with Versapak™ piggyback modules. So you can add exactly the capability you need, when you need it.

Extra flexible expansion for the IBM XT.

For the IBM XT, Time Spectrum not only delivers exceptional one-board expansion capability, but extra flexibility, too.

First, we designed Time Spectrum so you can add the RAM you want without having to fill the memory rows on the XT mother board.

Expandability from 64K up to 512K RAM expands your PC to handle the most complex tasks.

RAM and communications expansion modules are easily snapped onto the Time Spectrum.

Optional features are socketed on the board for maximum flexibility in expansion.

Double face waffle sockets with beryllium copper contacts hold component leads firmly in place.

Serial and parallel I/O ports permit interface with virtually any printer.

Calendar clock. It comes with a 1-yr. year rechargeable battery.

Connect a modem through a serial communications port and you can link your PC to the world of telecommunications.



And now, one-slot capability for your Texas Instruments PC.

Now there's even a Time Spectrum multi-function board for your TI PC. With it, you can add up to 512K RAM, two serial ports, calendar clock and light pen port—capability to handle even the most complex and difficult computing functions.

And still only consume one slot. The Persyst Time Spectrum board.

Maximum expandability now. And quality and versatility so you can keep on expanding later.

See your IBM or TI PC dealer and insist on Persyst.

PERSYST™

Persyst Products, Personal Systems Technology, Inc.,
15801 Rockfield Blvd., Suite A,
Irvine, CA 92714. Telephone:
(714) 859-8871. TWX: 467864.

THE TIME SPECTRUM™ BY PERSYST.

CIRCLE 512 ON READER SERVICE CARD

MICROHOUSE

MONITORS

Hitachi I.....	\$290
Hitachi II.....	499

GRAPHICS

Fastgraphs.....	\$189
D Graph.....	199

PRINTERS

Prowriter Parallel.....	\$429	Smith Corona Tractor.....	\$139
Prowriter Serial.....	629	Benana.....	239
Smith Corona TP-1.....	449	Grappler Plus.....	134

LANGUAGES

Basic 80 Compiler.....	\$289	Microsoft Cobol 80.....	\$539
Basic 80 Interpreter.....	259	muLisp/muStar.....	144
Msort.....	149	muSIMP/muMATH.....	189
Fortran 80 Compiler.....	289	C Compiler Apple.....	189

DATABASE

Dbase II.....	\$439
Dbase II/Dutil.....	499
Dutil.....	66
Quickcode.....	219

Tim III.....	\$275
Dastar.....	259
Infostar.....	279
Supersort I.....	149

US Autodial.....	\$479
Password.....	379
AutoLink 300.....	179
Hayes 1200 Baud.....	569

Hayes Smart Modem.....	\$239
Micromodem II.....	309
Hayes Chronograph.....	219
Crosstalk.....	117

COMMUNICATIONS

FINANCIAL

Supercalc.....	\$125
Supercalc II.....	179
Visicalc.....	189
Vistrend/Pilot.....	225
Multiplan.....	194
Calcart.....	99
Home Accountant for IBM.....	99
Planstar.....	395
Scratchpad.....	199
Money Decisions.....	79

WORDPROCESSING

Wordstar.....	\$279
WSMM.....	349
WSMM/SS.....	444
Starindex.....	119
Final Word.....	199
Superwriter.....	175
Spellguard.....	119
Spellstar.....	149
Mathstar.....	89
TMaker III.....	189

IBM HARDWARE

Quadboard 64K.....	\$ 295
Quadboard 256K.....	479
Quadboard II 64K.....	295
Quadboard II 256K.....	479
Quadcolor I.....	235
Microsoft 64K.....	259
Microsoft 128K.....	379
Microsoft 192K.....	519
Microsoft 256K.....	624
Datamac 12 Meg Intl.....	1899

We offer savings on the finest in software including Micropro, Sorcim, Ashton Tate, Fox and Gellar, Microsoft, Supersoft... and excellent buys in hardware peripherals, printers memory boards, modems, diskettes and supplies.



MEDIA

Maxell FD-1.....	\$40
Maxell FD-2.....	\$49
Maxell MD-1.....	\$31
Maxell MD-2.....	\$44

MICROHOUSE

A WISE CHOICE FOR
ALL MICRO PURCHASES!

TWO LOCATIONS TO SERVE YOU BETTER

TOLL FREE PHONES:

1•800•523•9511

BOX 499, DEPT. 200 BETHLEHEM, PA 18018

OR

1•800•FOR•SURE

P.O. BOX 4380, DEPT. 200 SPARKS, NV 89432

It's easy to
do business with
MICROHOUSE

Full tech support
Lower prices

We accept
MasterCard, Visa
American Express
and purchase orders

Prices subject to change without notice

CIRCLE 317 ON READER SERVICE CARD

ground and allows editing of the same or of a different document to take place at the same time. Print requests are maintained in a queue; because this list is kept in a file on disk, the number of files awaiting printing can be quite large. But PWP will not allow the user to exit to DOS while printing is in progress. If it is absolutely necessary to leave PWP, printing can be suspended and will resume automatically when PWP is next invoked, a feature made possible by the disk queue.

The program supports the most popular letter-quality printers as well as the Epson (IBM) printer. For personal use, the list is somewhat limiting, since the Epson is the only inexpensive printer on the list. However, this limitation can be overcome by defining your printer as a simple line printer; in this case, PWP does not output any special printer codes and accomplishes its task by brute force. This setting works for most dot-matrix printers.

PWP can be configured to support two printers at the same time and can be printing to each while editing continues. A third printer can be defined; this special setting (called printer number 3) directs the output to a file. Printer 3 can be defined as any printer PWP supports, so output can later be printed on the desired printer. Opting for printer 3 is also the method for obtaining a straight ASCII (all text, no control codes) version of the file.

The printer configuration process also determines how the printer is connected to the computer. PWP can therefore speak directly to any port and does not require device redirection, as provided by the DOS MODE command.

Formatting

Even without some of the more powerful formatting capabilities of WordPerfect, PWP can be considered rich in features. Margins, tab settings, and line spacing can be changed anywhere in the document. The right margin can be justified or not and can be changed anywhere in the document. A temporary margin can be set at any tab stop and maintained as long as desired. Boldface and underline commands are simple and the results are displayed on the screen. Any line can be centered; unlike many other programs, the fact that the line is centered is remembered from session to session. Decimal

Personal WordPerfect Measures Up

A feature-by-feature comparison of Personal WordPerfect with a hypothetical model word processor highlights its strengths.

Feature	Personal WordPerfect
For letter writing:	
Simplicity	More complicated than average
Easy to print	Yes
Performance	Very good
Inexpensive	Moderate
For manuscripts:	
Human factors	Above average
Navigation	Superb
Ability to handle documents of arbitrary size	Yes
Block operations	Yes (cut and paste via files)
Search operations	Yes (forward only)
Formatted on-screen display	Excellent
File system operations from within word processor	Yes
Headers and footers	Yes
Margin and spacing control	Yes
For technical or formal papers:	
All of the above plus:	
Footnotes	No
Temporary indentation	Yes
Search-and-replace operations	Yes
Superscript and subscript capability	Yes
For all applications:	
Excellent error detection and recovery	Yes
Ability to handle "disk-out-of-space" condition	Yes
On-line help facility	Excellent
Quick reference card	No
Sample files included with purchase	No
Vendor "hotline" for assistance	Yes
Other considerations	
Your printer supported	Could be better
Flexibility of printer choice	Excellent for expensive printers Poor for inexpensive printers
Ability to read straight text files (data import)	Yes, requires manual formatting
Ability to write straight text files (data export)	Yes
Display and print bold and underlined text	Yes
Control of single sheet printing	Yes
Ability to embed arbitrary printer control codes	Excellent

—W.F.

tabs allow the easy alignment of numeric columns. The page length can be varied from 1 to 108 lines and the number of lines that will be used for printing set to any value smaller than the page length. The page number can be reset to any value from zero up at any time. Subscript and

superscript are supported. PWP also offers a hyphenation range; it can be made to hyphenate more, or less, as the user desires. It supports headers and footers with an option of embedded page numbers.

Most of these formatting features are

True MAIL ORDER Prices

With so many so-called Mail Order establishments using "toll free" lines, and grandiose advertising, how can you, the customer, expect to receive true mail order savings? We have done away with these expenses to offer comparable service passing on the savings to you. Our reputation for low prices and satisfaction is outstanding.

DISKETTES

*Kangaroo: (w/library case)	
5 1/4" SS/DD	\$21.35
5 1/4" DS/DD	\$26.95
Now available: The 8-pak	
5 1/4" SS/DD	\$14.45
5 1/4" DS/DD	\$19.45
--- 10 yr. Warranty ---	
Elaphant:	
5 1/4" SS/DD	\$21.95
5 1/4" DS/DD	\$26.95
Verbatim:	
5 1/4" SS/DD	\$22.95
5 1/4" DS/DD	\$36.95
Dyan:	
5 1/4" SS/DD	\$29.95
5 1/4" DS/DD	\$36.95
Library Case 5 1/4"	\$ 1.75

MODEMS

Hayes:	
MicroModem II	\$285.00
with Terminal Program	\$255.00
without Terminal Program	
Hayes Smartmodem	\$199.00
300 Baud	\$505.00
1200 Baud	
Novation:	
J-Gal	\$1104.00
Aspen II	\$285.00
Smerical 1200 Baud	\$440.00
U.S. Robotics:	
300 Baud	\$185.00
1200 Baud	\$459.00
Password	\$CALL

COMPUTER PRODUCTS FOR IBM

The Ultimate Peripheral	
MONTE CARLO™ GT™ CARD	\$CALL
64K	
\$45 per 64K upgrade	
Ask about the Quattro™ Card	

T & G Products:	
Joysticks	\$42.00
Trakball	\$49.00

BUSINESS	
Visicorp:	
Vindex	\$180.00
Visfiles	\$180.00
256K Visicalc	\$180.00
Visitrend/Plot	\$225.00

ENTERTAINMENT:	
Infocom:	
Zork I	\$27.00
Zork II	\$27.00
Zork III	\$27.00

PRINTERS

OKIDATA:	
Microline 92	\$ 499.00
Microline 93	\$ 869.00
Juki Printer:	
* L-C * 18CPS	\$CALL
CITON:	
Prowriter I Parallel	\$ 369.00
Prowriter I Serial	\$ 489.00
Prowriter II Parallel	\$ 629.00
Prowriter II Serial	\$ 889.00
F-10 Starwriter	\$1150.00
F-10 Starmaster	\$CALL
Brother HRI:	\$ 775.00
Smith Corona TPI:	\$ 539.00
Star Micronics:	
Gemini 10X	Call for low prices!
Gemini 15	\$CALL

SPECIAL Columbia Data Products Personal Computer

Featuring:	
* IBM PC Compatibility	
* 16-bit 8086 Processor	
* 8 Expansion Slots	
* Two RS232C Serial Ports	
* Centronics Printer Port	
* Double Density Floppy Disk Controller	
* 128K RAM Standard Memory	
	\$CALL

TANDON DISK DRIVE SPECIAL

TM-100-2 DS/DD 320K Bytes	\$235.00
TM 55 320K Bytes Half Height	\$235.00

QuadRam Quadboard	
64K	\$285.00
128K	\$330.00
192K	\$375.00
256K	\$415.00

Kraft Products:	
Joysticks	\$55.00
Game Paddle	\$29.00

Davong Hard Disk	
5 Megabyte	\$1359.00
10 Megabyte	\$1759.00
15 Megabyte	\$2159.00

Maynard Electronics	
Floppy Controllers w/Parallel	\$209.00
Floppy Controllers w/Serial	\$239.00

MONITORS

Amdek:	
Color I	\$295.00
Color II	\$489.00
300G Green	\$145.00
300A Amber	\$155.00
310A Amber	\$175.00
Zenith: 12" Green	\$ 99.00
USI: 12" Amber	\$159.00
12" Green	\$155.00
*Taxen: Amber	\$139.00
PGS: RGB Monitor	\$ CALL
BMC: 12" Green	\$ 95.00
NEC 1203 Hi Res RGB	\$589.00

DISK DRIVES

For Apple:	
Fourth Dimension:	
w/o controller	\$219.00
w/ controller	\$309.00
Rana Elite I:	
w/o controller	\$270.00
w/ controller	\$339.00
For IBM:	
Shugart Half-Height	\$239.00

COMPUTER PRODUCTS FOR APPLE

MBI:	
VIP Graphics Card	\$109.00
AppleTime Clock Card	\$ 75.00
Silicon Valley Systems:	
Final Analysis	\$149.00
Word Handler	\$115.00
Continental:	
Home Acct.	\$ 49.00
On-Line:	
Screenwriter II Pro	\$139.00
Visicorp:	
Vindex	\$180.00
Visfiles	\$180.00
Visicalc	\$180.00
Visitrend/Plot	\$225.00
Stoneware:	
DB Master	\$154.00
DB Utility Pak	\$ 85.00
T & G Products:	
Joysticks	\$42.00
Select-a-Port	\$42.00
Game Paddles	\$26.00
Davong Hard Disks	
5 Megabytes	\$1359.00
10 Megabytes	\$1759.00
15 Megabytes	\$2159.00
Rem Cards	
Microsoft 16K	\$75.00
Generic 16K	\$60.00
Microsoft CP/M Z80 Card	\$249.00
80 Column Card:	
Vindex w/software	\$269.00

Send orders and inquiries to:

Computer Apparatus™

P.O. Box 32063 • Aurora, Colorado 80012

Telephone Inquiries: (303) 759-9251

Monday thru Friday — 9:00 a.m. to 5:00 p.m. (Mountain Standard Time)

**We built our reputation on low prices
for the informed computer user.**

DELIVERIES: 2 - 4 weeks average
PERSONAL CHECKS: Cashier's check and
money order will receive shipping preference
VISA & MASTERCARD Add 4% to total
CATALOG Send for full pricing details
Prices subject to change without notice

SHIPPING: UPS add \$2.00 plus
3% of order total, or we calculate
exact freight.

Executive Software Programming

images the future

1454-A CORTLAND AVENUE • SAN FRANCISCO • CA 94110

SCHOOL EXECUTIVE



Displays, prints, and stores grade forms, grade reports, class rosters, classes and registration, teacher room assignments, class schedules for each student, and the master student list. Groups students by family language, proficiency levels, grade level, sex, course of instruction, home room, and registered classes. Allows immediate access to all important student and class information on the screen or in easy-to-read printouts.

\$499.00

PC ANAGRAMS



an^a-a-gram ... A word formed by rearranging the letters of another word. PC Anagrams faithfully follows the rules of the original game. Players are exposed to new words, learn correct spelling, and expand their vocabulary. The level of play is determined solely by the players' skill with words. For all ages and grade levels. For two players or two teams.

\$29.95

SAFETALK



Safetalk can scramble any standard ASCII text file as are created by typical word processing programs and spread sheet programs. Produces standard ASCII text files which can be sent in coded form over electronic mail systems. Capable of 70,000,000+ possible cypher combinations by IPC.

\$49.95

EATSMART



Entertaining educational tool teaches the process of good nutrition - Calories, Proteins, Fats, Carbohydrates, Cholesterol. Designed by a registered dietitian, EatSmart calculates the nutrient content of meals for good health.

\$29.95

FULL SCREEN RAM EDITOR



Displays and edits full page of binary or hex numbers, page ahead, page back, key over, full cursor control with arrow keys.

\$29.95

See at Vanpak PC Software Centers

U.S.A. 800-551-0244 CALIFORNIA 800-551-0245

VISA and MasterCard Accepted

CIRCLE 267 ON READER SERVICE CARD

Figure 1: A listing of WordPerfect features that are not included in Personal WordPerfect

Advanced formatting

Advance line
Center over columns
Center page top to bottom
Conditional end of page
Double underline
Flush against right margin
Left margin release
Simultaneous left/right indent
Text columns (newspaper style)

Extended operations

Reverse search
Search and Replace with confirm
Macros
Automatic block move (Move key)
Math mode
Range append
Range uppercase/lowercase
Sheet feeder support
Dictionary (spelling checker)
Merge

obtained through the depression of one or two keystrokes, although some require selecting items from a menu. Even the most complicated are not difficult to invoke.

PWP's ability to alter formats at any time is one of its most powerful features. Keep in mind that anything can be changed at any point in the document. The flexibility of PWP is astounding.

Printer Control

Whether PWP supports your printer or not, there often are times when you want your printer to perform its own special tricks. PWP is in good control of the Epson and can deliver a number of fonts without much prodding. Since arbitrary printer codes can be embedded in the text with the Print Modes key, most printer features can be accessed. I have used the feature to obtain italics on my Epson, something that PWP cannot do by itself.

File Management

PWP has a very extensive set of filing

capabilities. Its file management menu can be used to display a list of files on a particular drive or, in the case of DOS 2.0, a directory. DOS-style filename templates can be used to list a subset of files. When this menu of files is displayed, the cursor keys can be used to move a pointer to any one of the files; the file can then be retrieved, printed, deleted, or renamed.

PWP also can be told which drive or directory is its default, the equivalent of switching disk drives in DOS. Changing the disk default does not affect PWP's ability to find its own files.

The program has been thought out carefully in two other ways. First, the user always is warned before a file on the disk is overwritten, and the opportunity to stop is offered. Further, if the user opts to overwrite the file, the original is held in a temporary backup file until the new version has been successfully written to disk. Sec-

At last, Software the whole family can use!! and keep using...

- Looking for Software with long testing educational value?
- Trying to find Software YOU can benefit from?
- Tired of games your kids get bored with?



LOOK NO FURTHER!!

SPEEDREAD+ teaches rapid, efficient reading in minutes a day. Up to 5000 wpm, Speedread+ benefits any reader, beginning through advanced.

WHY PAY THE HIGH COST OF WELL-KNOWN SPEED-READING SCHOOLS when you can train in the convenience of your own home, on your own time schedule, at your own pace and at only 1/2 the price!

Order SPEEDREAD+™ and watch your reading speed climb!!
List Price - IBM: \$79.95, Apple/Atari/Commodore/TRS 80: \$64.95
Ask for MEMOREASE+™; memorize quicker and remember longer



INET Corp., 536 Weddell Dr., Sunnyvale, CA 94089
Tel: (408) 734-0593

CIRCLE 315 ON READER SERVICE CARD

PWP's ability to alter formats at any time is one of its most powerful features.

ond, the dreaded "disk-out-of-space" condition is handled properly; the user is given the opportunity to insert a different disk.

Summary

Figure 1 lists those features that WordPerfect provides beyond those found in Personal WordPerfect. I provide the chart not to diminish PWP, but as a guide to which features are sacrificed in the less expensive product.

There is one new feature coming for PWP, which should be available as you read this. SSI's dictionary, now a standard feature with WordPerfect, will become a \$95 option with Personal WordPerfect.

Choosing a word processor is a chore. I have prepared a list (taken from the 1983 Creative Computing Software Buyers' Guide) of features to look for and marked it according to PWP's features and capabilities. I think the chart speaks for itself. It shows PWP to be fully featured and very powerful, especially in light of its \$195 price. /PC

THE LAST ONE

The first program you should buy.

The more you use your computer, the more you want it to work for you.

But where do you begin? There are literally thousands of programs. It's time consuming, confusing and frustrating! The answer is to begin with THE LAST ONE™.

THE LAST ONE... The program that writes programs!

Now, for the first time, your computer is truly 'personal'. Now, simply and easily, you can create software the way you want it.

From Accounting to the Zodiac, THE LAST ONE puts you keystrokes away from whatever you need from your computer.

THE LAST ONE... See it at your dealer and buy it first!

Available for Commodore 64™, Commodore 8032™, IBM PC™, Victor 9000™, Apple II™ and IIe™, Radio Shack Model II™ and most CP/M™ systems.

Distributed by
**Computer
Marketing**
Services, Inc.

300 W. Marlton Pike, Cherry Hill, NJ 08002 (609) 795-9480

Product of BLUE SKY SOFTWARE

*THE LAST ONE is a registered trademark of D. J. "Al" Systems, Ltd.

The Commodore 64 & CBM 8032, IBM PC, Victor 9000, Apple II & IIe, Radio Shack Model II, and CP/M are registered trademarks of Commodore Business Machines, Inc., International Business Machines Corp., Victor Technologies, Inc., Apple Computers, Inc., The Tandy Corporation, and Digital Research Corp., respectively.

CIRCLE 119 ON READER SERVICE CARD

From your mind's eye to the screen.

Bring images to life, with color, resolution, and the speed of thought.

Use CONO#GRAPH™ — the intelligent color display graphics system for your IBM PC. CONO#GRAPH delivers the performance of a professional graphics workstation for the price of a business graphics system.

The modular CONO#GRAPH system lets you start with the CONO#COLOR™ Adapter for quality color and high resolution, and later add the optional CONO#GEN™ module for increased processing power and speed.

Choose from 256 colors.

The CONO#COLOR Adapter provides a spectrum of 256 colors. Select a palette of 16 colors for simultaneous on-screen display. Modify the palette dynamically to provide instantane-

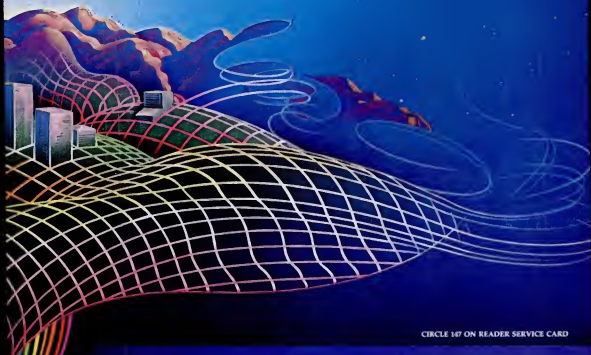
ous color changes and special effects including motion.

Resolution to 640 x 400.

The CONO#COLOR Adapter supports IBM-compatible resolutions of 320 x 200 and 640 x 200, plus four other modes, up to 640 x 400, each with 16 of 256 on-screen colors. And up to four selectable pages of video memory let you modify one page while another is being displayed — for special effects like animation.

The CONO#COLOR Adapter gives you more.

The CONO#COLOR Adapter's 128K bytes of high speed memory and unique design will



CIRCLE 147 ON READER SERVICE CARD

reduce your image build-up time, and eliminate any flicker when scrolling. Four different output channels are provided—including IBM-compatible digital IRGB—as well as RGB analog, true NTSC at all resolutions, and channel-selectable RF. The CONO#COLOR Adapter also features a light pen interface capable of resolving ≈ 1 pixel, and an interface to the CONO#GEN high performance graphics processor.

Add CONO#GEN for speed and processing power.

CONO#GEN is a powerful graphics processor that greatly reduces image creation and manipulation times. Its dedicated Motorola 6809 microprocessor frees your IBM PC's microproces-

sor to perform other tasks. Special purpose hardware generates vectors, circles, ellipses (at any orientation), arcs and conic curves at up to 800,000 pixels per second. Hardware also provides a 2K x 2K addressable area, rectangle fill, line texturing and high speed erase.

CONOGRAPHY™ for device independent graphics.

CONOGRAPHY is to curves what vectors are to straight lines. Using CONOGRAPHY, images are produced with less data. The result is faster image transmission, lower data storage requirements, fewer calculations, and device independent graphics.

Easy to install.

The CONO#GRAPH system is easy to add to your IBM

PC. The CONO#COLOR Adapter substitutes for IBM's Color/Graphics adapter. The CONO#GEN module connects to the CONO#COLOR Adapter to provide added speed and processing capability. Both together fill a single expansion slot. And they're modular, so you can add color and resolution now and speed later.

Easy to use.

Efficient software makes graphic images simple to create. The CONO#GRAPH system supports the IBM graphics and character modes so that existing software runs without modification. And the CONO-LIB™ program provides an extensive library of subroutines for scaling, rotation, fill, image creation, labeling, recall, and more—under

PC-DOS for BASIC, C, PASCAL, FORTRAN, or assembler. Future software will include CP/M-86 compatibility and sophisticated yet easy-to-use application programs.

From your mind's eye to the display screen with the speed and vivid color of thought itself. Ask your nearest IBM PC dealer for more information.



2268 Golden Circle,
Newport Beach, CA 92660
714/650-2666
Dealer inquiries invited.

TELigraph

The Universal Graphics Tool

FEATURES: Sophisticated graphics in minutes, with 8 colors, 7 shades of gray and almost limitless textures. Graphic objects are macro-definable — Merged graphics and text: 7 character sizes are provided, including all international characters and special symbols. Characters can be colored as well as rotated and located on any pixel of the screen — Full communications facilities for graphic pages. Typical transmission time per screen: 15 seconds at 300 Baud — undistorted graphics printout in up to 5 sizes on any Epson printer (MX80/82/100, models II and III). All aspect ratios are corrected and colors are translated as shades of gray — Extremely compact graphic files: 300 to 500 screens can be stored on a 320 Kb diskette — Highly user-friendly, with full screen help available at any time, for any operation — Extensive & accurate documentation includes



When we say this is the Universal Graphics Tool,
we mean just that!

tutorial guide, and reference index. **PLUS:** TELigraph is the full implementation of the NAPLPS-TELIDON World Standard, an elegant and powerful concept for graphics creation and transmission. This standard has already found thousands of professional applications: TV animated commercials, computer assisted education, design, flowcharting, games, etc.... TELigraph does not generate a bit image of the screen, but a stream of machine codes that describe the generated graphics. Thus, the graphics you create today on the IBM 320 x 200 dot screen will be fully compatible when you upgrade to our

512 x 512 (or 1024 x 1024) dot systems. Plus, TELigraph allows you to transmit and receive pictures to or from ANY machine or data-base that is NAPLPS-Telidon format — and we're working hard to get the package running on other popular micro and mini-computers.



CIRCLE 328 ON READER SERVICE CARD

Minimum System requirements: IBM Personal Computer with BOTH color & monochrome screens - 256K Memory - One disk drive

Keyboard-Input version: \$398.95 (CANADA: \$495.95)
Graphics Editor - Decoder - Communications - Slide Show
Ask your local dealer or order directly from Microtaure
MasterCard - Money Order - Certified Cheque

Intelligent professional graphics tablet version available soon.
Tablet resolution: .001 inch - Sizes: from 11" x 11" to 42" x 60"
Dual RS-232 ports, stylus & crosshair cursor included

MICROTAURE Inc.,
P.O. Box 6039, STATION "J"
OTTAWA (ONT.) K2A 1T1
(613) - 745-6661

wabash diskettes ^{for as low as} \$1.29 each!

Now get Wabash Quality at a CE Price

For over 17 years, Wabash has been making high quality and dependable computer products. Wabash diskettes are made to provide error-free performance on your computer system because every diskette has been totally and hypercritically tested. Since you can now buy Wabash computer products directly from CE, the world's largest distributor of magnetic media, you can now get maximum savings on every order. You can even order toll-free.

New Wabash Six Year Warranty

The quality of Wabash diskettes is stressed throughout the entire manufacturing process. After coating, all Wabash diskettes go through a unique burnishing process that gives each diskette a mirror-smooth appearance. Wabash then carefully applies a lubricant that is specially formulated to increase diskette life. Then, to keep out foreign particles, a unique heat seal bonds the jacket and liner together to help prevent contamination. After 100% hypercritical testing and certification, Wabash then packages each diskette (except bulk pack) in a super strong and tear resistant Tyvek® envelope. The final Wabash product is then shrink-wrapped to insure cleanliness and reduce contamination during shipment. Wabash diskettes are so very reliable that Wabash now offers a six year warranty in case of defects in materials or workmanship on all diskettes purchased directly from Communications Electronics.

New...Wabash Diskette Duplication Services

Communications Electronics has teamed up with Wabash to provide a single-source solution for the diskette duplication requirements of software developers, OEM's and distributors. All service is in-house, to give you fast, dependable service. In most cases, delivery can be completed in five days. Whether you require 100, 1,000, or 10,000 copies per week, call CE first for a no obligation price quote. For additional information, please write us on your letterhead with your requirements.

Quantity Discounts Available
Wabash diskettes are packed 10 disks to a carton and 10 cartons to a case. The economy bulk pack is packaged 100 disks to a case without envelopes or labels. Please order only in increments of 100 units for quantity 100 pricing. With the exception of bulk pack, we are also willing to accommodate your smaller orders. Quantities less than 100 units are available in increments of 10 units at a 20% surcharge above our 100 unit price. Quantity discounts are also available. Order 500 or more disks at the same time and deduct 1%; 1,000 or more saves you 2%; 2,000 or more saves 3%; 5,000 or more saves 4%; 10,000 or more saves 5%; 25,000 or more saves 6%; 50,000 or more saves 7%; 100,000 or more saves 8%; 500,000 or more saves 9% and 1,000,000 or more disks earns you a 10% discount off our super low quantity 100 price. Almost all Wabash diskettes are immediately available from CE. Our efficient warehouse facilities are equipped to help us get you the quality product you need, when you need it. If you need further assistance to find the flexible disk that's right for you, call the Wabash compatibility hotline. Dial toll-free 800-323-9668 and ask for your compatibility representative. In Illinois or outside the U.S. dial 312-593-6363 between 9 AM to 4 PM Central time.



Buy Wabash Diskettes with Confidence

To get the fastest delivery from CE of your Wabash computer products, we recommend you phone your order directly to our Computer Products Division and charge it to your credit card. Be sure to calculate your price using the CE prices in this ad. Written purchase orders are accepted from approved government agencies and most well rated firms at a 30% surcharge for net 30 billing. For maximum savings, your order should be prepaid. All sales are subject to availability, acceptance and verification. All sales are final. All prices are in U.S. dollars. Prices, terms and specifications are subject to change without notice. Out of stock items will be placed on backorder automatically unless CE is instructed differently. Minimum prepaid order is \$50.00. Minimum purchase order \$200.00. All shipments are F.O.B. Ann Arbor, Michigan U.S.A. No COD's please. Non-certified and foreign checks require bank clearance.

For shipping charges add \$8.00 per case or partial case of 100 8-inch flexible disks or \$8.00 per case or partial case of 100 5 1/4-inch mini-diskettes for U.P.S. ground shipping and handling in the continental U.S.A.

Mail orders to: Communications Electronics, Box 1002, Ann Arbor, Michigan 48106 U.S.A. If you have a Visa or MasterCard, you may call and place a credit card order. Order toll-free in the U.S. Dial 800-521-4414. In Canada, order toll-free by calling 800-285-4828. If you are outside the U.S. or in Michigan dial 313-994-4444. Telex anytime 810-223-2422. Order your Wabash diskettes today.

Copyright © 1983 Communications Electronics™

Ad # U12453

SAVE ON WABASH DISKETTES

Product Description

Part # CE quant. 100 price per disk (\$)

5" SS00 IBM Compatible (128 B/S, 25 Sectors)	F111	1.89
5" SS00 Shugart Compatible, 32 Hard Sector	F31A	1.89
5" SS00 IBM Compatible (128 B/S, 25 Sectors)	F131	2.39
5" OS00 Soft Sector (Unformatted)	F14A	2.99
5" OS00 Soft Sector (256 B/S, 25 Sectors)	F14A	2.99
5" OS00 Soft Sector (512 B/S, 15 Sectors)	F14S	2.99
5" OS00 Soft Sector (1024 B/S, 8 Sectors)	F14T	2.99
5 1/4" SS00 Soft Sector w/Hub Ring	M11A	1.49
5 1/4" Same as above, but bulk pack w/o envelope	M11AB	1.29
5 1/4" SS00 10 Hard Sector w/Hub Ring	M41A	1.49
5 1/4" SS00 15 Hard Sector w/Hub Ring	M51A	1.49
5 1/4" SS00 Soft Sector w/Hub Ring	M13A	1.79
5 1/4" Same as above, but bulk pack w/o envelope	M13AB	1.59
5 1/4" SS00 10 Hard Sector w/Hub Ring	M43A	1.79
5 1/4" SS00 15 Hard Sector w/Hub Ring	M53A	1.79
5 1/4" OS00 Soft Sector w/Hub Ring	M14A	2.99
5 1/4" Same as above, but bulk pack w/o envelope	M14AB	2.49
5 1/4" OS00 10 Hard Sector w/Hub Ring	M44A	2.99
5 1/4" OS00 15 Hard Sector w/Hub Ring	M54A	2.99
5 1/4" SS00 Soft Sector w/Hub Ring (96 TPI)	M15A	2.99
5 1/4" OS00 Soft Sector w/Hub Ring (96 TPI)	M15B	3.99
5 1/4" Tyvek Diskette Envelopes - Price per 100 Pack	TE6	12.00

SS00 = Single Sided Single Density; SS00 = Single Sided Double Density; OS00 = Double Sided Double Density; SS00 = Single Sided Quad Density; OS00 = Double Sided Quad Density; TPI = Tracks per inch.



Order Toll-Free!
800-521-4414

In Michigan 313-994-4444

wabash
error-free
diskettes

C COMMUNICATIONS ELECTRONICS™

Computer Products Division

818 Phoenix □ Box 1002 □ Ann Arbor, Michigan 48106 U.S.A.
Order TOLL-FREE 800-521-4414 or outside U.S.A. 313-994-4444

We took the local networking system you thought was out of your league. And put it in your lap.

Now that you have a personal computer, we bet you're looking for even more ways to do your job quickly and productively.

That's why you'll want to know all about local networks. Because if you pick the right one, it will put a whole array of equipment and sophisticated capabilities right where they belong.

In your lap.

Networking via Ethernet.

For many of you, local networking is synonymous with Ethernet: the network that allows fast, powerful communication between computer equipment. The network adopted worldwide by more than thirty of the computer industry's biggest companies.

Unfortunately, a lot of you think that an Ethernet-based local network for personal computers would be too expensive. Difficult to install. Or only for the big guys.

Wrang, wrong, wrong.

Because 3Com Corporation just announced EtherSeries: a family of integrated local networking hardware and software products specifically designed for personal computers. It's available now for the IBM PC, with Apple and other popular computers not far behind.

Big-league advantages, little-league prices.

With EtherSeries, you can electronically transfer data files, text files and program files back and forth between any PC on the network at an incredible 10 Mbps



transfer rate. Which means you can read or write any file on another PC's diskette, just as if it were on your own PC. Without ever leaving your desk.

You can even direct the output from your PC to another PC's printer. Just as quickly, just as easily, just as efficiently.

And since EtherSeries products are software-transparent to IBM DOS (as well as your personal programs and popular programs like Visicalc*, Wordstar* and PFS*: File) you just use standard IBM DOS commands.

What's more, you can start this sophisticated network with only one other PC. Install it yourself using only a screwdriver. Then add more PCs one at a time—up to hundreds—all on the same Ethernet.

For as little as \$950 a PC.

And that's just the beginning.

Step up to the EtherSeries network server and get all the advantages of a hard disk: like faster access time and data integrity. You can even execute programs and use data developed by another user without copying (or even touching) a diskette.

Add-on software packages give

you automatic shared use of letter-quality printers. There's even a comprehensive electronic mail system that will bring you out of the dark ages of communicating with pen and paper: a powerful editor lets you compose a message or report right on your PC, then electronically sends it to other users. So everyone gets timely information without piles of paperwork.

So call a 3Com Sales Office, your local computer store, or send us the coupon below. We'll tell you more about how to put a local networking system in your lap.

Then you can decide for yourself what league you're in.

- Mountain View, CA (415) 961-9602
- Valencia, CA (805) 257-3633
- Park Forest, IL (312) 798-3266
- Bethesda, MD (301) 656-1857
- Manchester, NH (603) 623-5633

3Com

Tell me more.

- ☐ Send me the EtherSeries Book.
- ☐ Have a salesperson call.

Name

Title

Company

Division

Address

City/State/Zip

Phone

Mail to: 3COM Corporation
1390 Shorebird Way,
Mountain View, CA 94043

Porting programs down from mainframe to micro is just one in a series of trends that will pave the way for custom-designed, task-specific software for every conceivable business application.

Software Migrations

When the PC was unveiled 27 short months ago, microcomputer software authors and publishers scrambled to move their word processors, database managers, spreadsheets, games, modeling programs, and spelling checkers to the new machine with its more powerful 16-bit central processing chip and operating system.

The race to market PC versions of existing programs could be called the first software wave and included such manufacturers as MicroPro with its WordStar family of programs, Sorcim with Supercolc, VisiCorp with its Visi-series of business packages, Ashton-Tate with dBASE II, and, of course, Microsoft with the MS-DOS operating system and its languages.

In retrospect, the crash efforts of these companies were only the first in a series of software waves. A second wave, software written specifically for the start-up companies such as Lotus (1-2-3), Context (MBA), and Information Unlimited Software (Easy Writer I and II) is upon us now, and the third and fourth waves of software are following closely behind. The fifth wave of software, while still several years away, is in its beginning stage.

The third wave, which could be called the mainframe migration, will bring programs currently running on mainframes and minicomputers to the PC. This will offer small businesses and individuals unprecedented personal computing power—more power than anyone could have imagined a few years ago when the first microcomputers were marketed for hobbyists and small business owners.

The marketing of mainframe software has been relatively slow for several reasons. First, 2 years—nearly a generation in today's microcomputer world—is barely enough time to design a sophisticated program for a mainframe computer. Second, the theoretical ability of the IBM PC to manage 1 megabyte of on-line memory and significant amounts of storage was not fully realized until the introduction of the IBM XT with its 256K RAM motherboard and 10 megabytes of dependable storage. Third, reliable software tools, such as FORTRAN and COBOL compilers, needed to transfer the source code of sophisticated mainframe programs to the PC, have only recently become available.

The fourth wave of PC software, which

could be called the mainframe connection, will allow users of IBM PCs to capture small portions of huge mainframe databases and to use the data for analysis and modeling. Eventually, users will be able to obtain data from a mainframe, make changes, and return the data, at which point data processing managers will supervise its reinstallation into their huge databases.

The Mainframe Migration

Mainframe software manufacturer Primavera Systems, Inc., of Bele Cynwyd, Pennsylvania, is looking eagerly at the PC marketplace. As is typical of many of the mainframe software houses, this company has been hard at work in recent months creating a PC version of its critical path analysis system called Project Management and Control (PROMAC), which will soon be available. PROMAC has been in use on the IBM 370 for nearly a decade.

The PC product, which will be called The Primavera Project Planner, will be menu driven. Changes to information contained in the software will be made through screen editing. Screen "win-

dows" will allow users to look at different portions of the project simultaneously.

Richard K. Faris, vice-president of technical development for Primavera Systems, explained, "We know that a program written for a mainframe will not fly in the micro world, because people demand programs that are easy to use.

Mainframe programs are almost never easy to use."

Faris acknowledged that there were several available microcomputer control program management (CPM) and project management programs: "There are a number of very small unsophisticated systems handling several hundred tasks. But we

handle up to 10,000 tasks on an XT with multiple windows with which you can view the interaction between tasks and adjust information about the nature, cost, and timing of the task."

With Microsoft's 3.1 FORTRAN 77 (which Faris preferred to IBM's version), conversion of the project manager from mainframe to PC was not difficult. "I converted the program once before to a \$500,000 Data General 16-bit Eclipse. The conversion to the PC was easier, and the PC version runs more efficiently."

Faris said his target market was large companies that use project management and are buying PCs by the score. "Those that have used project management programs on a mainframe will be surprised to find the capabilities that we offer. We provide 90 percent of the functionality for 5 to 10 percent of the price. We feel we can sell the planner at about \$2,500, because the PC market is exploding. The relative portability and independence of the PC also provides an opportunity to take data directly to job site," he added.

Primavera also expects to sell the system to smaller businesses, which previously may have been unable to afford a mainframe-quality project management program.

Regarding the IBM PC, Faris said, "I love it. I've been programming since 1966, beginning on an ancient IBM. I think that mainframe computing is an archaic way to deal with computers. I got used to using minicomputers. The IBM XT is very much akin to using a minicomputer, but with the XT, I never have to share with anyone else.

"In my opinion," he continued, "the future of computing is networking with PCs and using mainframes for specialized tasks, such as large-scale data extraction and number crunching. Many applications on mainframes could be done better on the PC."

Mini Migrations

Software also is coming to the PC from the minicomputer world. One recent entry to the increasingly crowded PC database management field is Sequitur, billed by its creator, Pacific Software Manufacturing Company of Berkeley, California, as "the first-ever database word processor system."

Sequitur was originated on a Digital Equipment Corporation (DEC) VAX PDP-

TSL's new Hard Disk Drive FALCON stores 30 MILLION BYTES

Formatted

and

- Installs in minutes on your IBM-PC
- can be configured to run either under DOS 1.1 or DOS 2.0
- the disk controller uses error correcting algorithms for maximum reliability.
- uses high quality CDC WREN hard disk for storage.

TSL's FALCON stores *ninety times* as much data as your PC double-sided floppy disks.

TSL's INTRODUCTORY PRICE

\$3995⁰⁰

limited
time
offer

Includes a full
90 day warranty.

To order your FALCON at this price or to find out if FALCON interfaces with your PC, call (314) 343-9140 or write:

FALCON
Teknar, Inc.
Dept. 11-83PC
306 Axminster Drive
Fenton, MO 63026
Dealer inquiries invited



Always a step ahead.

CIRCLE 332 ON READER SERVICE CARD

11 about 3 years ago and soon thereafter was moved to the 68000 with the UNIX operating system.

THE FUTURE of computing is networking with PCs and using mainframes for specialized tasks.

According to Tim Colstad, vice-president of Pacific Software, the Sequitur is a powerful relational database with a text-handling package. It is designed following the "query-by-example" concept developed by IBM for its Sequel database. (The well-known timesharing program Oroclia is also modeled after Sequel.)

One of the interesting features of the word-processing portion of Sequitur is

that each cell can represent a window into a potentially larger text. Since Sequitur uses "query by example," the user gives the program an example of the type of data he wants brought to the screen.

Because Sequitur is written in C, moving it to the IBM PC was not difficult, according to Colstad. He added that the PC version of Sequitur, although less expensive than those for the 68000 or PDP-11, is comparable to the version of Sequitur designed to run on the VAX and the Fortune 32/16. "In fact, the word-processing portion is better on the IBM. In the micro world, people expect a program to do everything, so we are going to try to accommodate them," he said.

Sequitur, however, was not intended as a be-all-and-end-all program. "We are not going to try to sell it as a spreadsheet," continued Colstad. "I think it wouldn't be fair to the user."

What Sequitur will do is impressive. It includes the functions Selection, Join, Sort, Union, Intersection, Difference, Unique, and Duplicate. The Forms com-

mand allows you to prepare form letters and documents containing data from the Sequitur data tables. The word processing functions include word wrap; text block move; end move by character, word, sentence, paragraph line, or table entry. Search and replace commands accommodate wildcards; mail-merge functions are included.

Like the Primavera Project Planner, Sequitur for the PC will cost less than 10 percent of the price of the same program running on a mini. The suggested retail price for the product, scheduled for an early fall release, is \$795. This compares to a \$12,000 price tag on a PDP-11 and \$1,395 on Fortune 32/16. Of course, the latter two computers can support many users.

The Mainframe Connection

The fourth wave, which could be called the mainframe connection, will give PC users in a business environment the ability to access and modify information from a time-sharing network or main-

Think Fast

EDO 易重力

The Game of Many Strategies

EDO is the game of many strategies. Change is rapid and movement is constant on a colorful game screen. You must think straight but think fast. Control territory while you can, but keep in mind that danger often wears a smile. Edo, inspired by study of the Oriental mind, now comes into your mind through first class software.

Requires IBM® PC with DOS 1.1 or 2.0, 64K memory, color/graphics adapter and color monitor.

Ask for EDO™ at fine computer stores. Other First Class Software from Xor.

AGENT 2.0™ A Test of Analytical Skill
BLU CHIP™ Portfolio Manager
C TOOLS™ C Language Utilities
THOTH™ Action List Data Base Manager

ST. HIPPOLYTE'S WALL™ The Complex Challenge

XOR™

CORPORATION

FIRST CLASS SOFTWARE

5421 Opportunity Court
Minnetonka, MN 55343
(612) 938-0005



Meet Dr. LogoTM

The world's best computer teacher.

Anyone in your family can learn to program a personal computer with Dr. Logo. This remarkable new learning language from Digital Research uses pictures and movement to teach programming...and that makes programming so easy, clear and entertaining, it's child's play to learn. What's more, everything you need is built in. Simply load the language and you're ready to run. See Dr. Logo now at a participating IBM PC dealer. Call 800-227-1617, ext. 400 (in California, 800-772-3545, ext. 400) for the location nearest you.

Now see Dr. Logo at most IBM PC dealers.

The Dennis characters are registered trademarks of Hank Ketcham Enterprises, Inc. © Digital Research 1983. The logo, tagline, Dr. Logo and the Dr. Logo character are either trademarks or registered trademarks of Digital Research Inc.



**DIGITAL
RESEARCH**

CIRCLE 225 ON READER SERVICE CARD

frame database. Major mainframe data processing software companies from the mainframe world, such as Informatics General Corporation, Cullinet Software, Inc., On-Line Software International, and McCormack & Dodge Corporation, are offering PC users access to their data and are competing with one another for the most effective end easy-to-use system. Each of these mainframe software giants has entered into working arrangements with major microcomputer software publishers.

Informatics, for example, has developed a program with VisiCorp called VisiAnswer. VisiAnswer is the microcomputer portion of the joint program. For the mainframes, Informatics is supplying a slightly less powerful version of its DB Answer, a \$65,000 IBM mainframe information retrieval system. VisiAnswer is designed to interface with VisiCalc, VisiCorp's software flagship with its 250,000 users, and VisiOn, its still unreleased operating environment for the IBM PC.

The VisiCorp/Informatics game plan is

to provide two things: the communications and conversion software necessary to allow an intelligent exchange of data to take place between a PC and a mainframe computer; and the ability for the microcomputer user to query the mainframe database, identify himself (that is, pass the required security clearance), and capture

SEQUITUR is a powerful relational database with a text- handling package.

(download) data in a form that can be immediately used or stored for use with a VisiCalc model.

Initially, VisiAnswer will not allow data developed on a microcomputer to be sent back to the mainframe, but doing so

would be more of a political problem than a technical challenge, according to Merritt M. Lutz, a group vice-president of Informatics General.

"Putting data back into a large, carefully controlled database is a chancy thing to do, and it is not all that acceptable to most data processing professionals," he said.

The Informatics philosophy, according to Lutz, is to strike a balance between the concerns of the professional who wants to work with valid data on his personal computer and the data processing manager concerned with the security, accuracy, and timeliness of the data that will be analyzed, and on which the company's decisions will be based.

"We believe," said Wilson Cooper, another Informatics vice-president, "that through VisiAnswer we will be able to provide the database professional with a great deal of security and provide the end-user with the capability to obtain data that he has a need for."

"Another thing that makes the DB Answer/VisiAnswer connection differ

Your
breakout on a disk



Portfolio Manager

The data base for investors - with spreadsheet capabilities. Evaluate your portfolio quickly and simulate future opportunities with ease. Generate reports when you need them in a form you can use. Your investments are important. Manage them with first class software.

Requires IBM® PC with DOS 1.1 or 2.0, 128 K memory, and color/graphics adapter. Color monitor suggested.

Ask for Blue Chip™ at fine computer stores. Other First Class Software from Xor

AGENT 2.0™ A Test of Analytical Skill

C TOOLS™ C Language Utilities

EDO™ The Game of Many Strategies

THOTH™ Action List Data Base Manager

ST. HIPPOLYTE'S WALL™ The Complex Challenge

XOR™
CORPORATION

FIRST CLASS SOFTWARE

5421 Opportunity Court
Minnetonka, MN 55343
(612) 938-0005

ent," Wilson continued, "is that it is much more than file transfer. The database is extracted at the mainframe level, and a subset is created on the mainframe before it is delivered to the micro. The key issue is where the data is manipulated. I think this should be done at a level where computing power is greatest."

To deal with conflict between the corporate worker and the data processing manager, Informatics has developed the concept of the "personal information center."

"The personal computer revolution has swamped data processing departments. And, in a way, it has taken a lot of

the sizzle away from the traditional information centers of a company," said Lutz. "PCs are getting so big and so sophisticated so fast that we believe that in many corporations the growth of these personal information centers will be much faster than the traditional information center. Any PC that can be a logical extension of the database makes an incredible contribution to corporate effectiveness if it is properly controlled. But the PC is not the key; software like VisiAnswer is really the key," Lutz continued.

SENDING
data back to the
mainframe would be
more of a political
problem than a
technical challenge.

Perhaps a unique aspect of the VisiAnswer concept is that it is not tied to any particular mainframe database. In fact, the information retrieval query process is expected to work equally well with in-house databases and time-sharing information services.

Projected sale price for Answer DB and VisiAnswer connected to 50 PCs and one mainframe will be about \$45,000, according to Wilson.

Another company actively pursuing the mainframe connection is Lotus Development, whose only product is 1-2-3, the first integrated database manager/spreadsheet developed for the IBM PC.

Lotus already has worked out agreements with McCormick & Dodge, Management Decision Systems (EXPRESS) and ADP Network Services, a time-share agency, to provide for the downloading of information from these mainframes into the PC for use with 1-2-3. In addition, the company claims to be working on agreements with 15 other mainframe software and hardware vendors interested in opening up a microcomputer channel for their products.

"You will be able to call up data stored on a mainframe, download it into your personal computer, do some modeling

FORGET THEIR PRICE: WE HAVE LOWEST PRICED SOFTWARE IN PC!

YOUR PRICE

COMPUTERS

IBM PC \$2499
COLUMBIA 1600-1 \$2349
EAGLE II \$2349

PRINTERS/MODEMS BOARDS

C. ITOH (All Models)
NEC & SPINWRITERS (All Models)
BROTHER (All Models)
OKIDATA (All Models)
DIABLO (All Models)
EPSON (All Models)
PLANTRONICS COLOR PLUS \$379
HAYES SMARTMODEM 1200 \$479
HAYES SMARTMODEM 300 \$205

• We carry ALL SONY Interfaces
and Monitors •

MONITORS

PRINCETON GRAPHICS \$479
(Hi Rez Color Monitor)
QUADRAM QUADCHROME \$469
(Hi Rez Color Monitor: 690 x 480)
AMDEK COLOR II \$419
AMDEK 300A \$149
NEC JC 1203 (Hi Rez RGB Color) \$589
SONY PVM 1270 O \$ 895
(Super Hi Rez RGB 12" Color Monitor)
SONY RVP-460 \$6,999
(46": 16 RGB Colors, 80 Characters)
SONY JX-1211 HG PROFEEL \$699
(12" RGB Monitor/TV)

SOFTWARE

SUPERCALC \$125
LOTUS 1-2-3 \$325
EASYWRITER II \$189
EASYFILER \$235
VISITREND-PLOT \$215
dBASE II ASHTON TATE \$389
WORDSTAR \$255
INPOSTAR \$269
SUPERCALC II \$159
MULTIPLAN \$177
THE LANDLORD \$349
B.L. STRATEGIST ASHTON TATE \$259
FINANCIAL PLANNER ASHTON TATE \$469
d GRAPH \$189
VISICALC \$169
ACCOUNTING PLUS \$349
HOME ACCOUNTANT \$ 97
SPELLSTAR \$139
SPELLBINDER \$249
SUPER SPELLGUARD \$119
VOLKSWRITER \$127
SUPERWRITER \$169
MAILMERGE \$135
PEACH PAK \$349
CONDOR 20-1 \$209
CONDOR 20-3 \$459
WORDSTAR/MAILMERGE/ \$395
SPELLSTAR/STAR INDEX \$179
QUICKCODE
ULTIMATE \$329



TECH (415) 398-1004

Division of Tokyo Electronic Corporation

222 KEARNY STREET, SAN FRANCISCO, CALIFORNIA 94108 (415) 398-1004

We offer ALL other PC Software at your price, not theirs.
WE GIVE CORPORATE, GOVERNMENT, AND INSTITUTIONAL DISCOUNTS ON HARDWARE.

CIRCLE 457 ON READER SERVICE CARD

with it, end ship the product back to the mainframe," is how Carl Gritzmaker, national accounts sales manager for Lotus, explained its mainframe connection.

In discussing the relative merits of the 1-2-3 connection with that of VisiAnswer or VisiOn, Gritzmaker indicated that the speed and power of 1-2-3 itself would be a determining factor. "We have definite advantages over Informatics' VisiAnswer package," he said.

The Fifth Wave

Though the mainframe connections will have an important impact upon businesses using PCs, the most significant impact may not be in the microcomputer world at all. Rather, it will be in the data processing centers of major corporations, which will have to come to terms with the inevitable decentralization of computing and data processing.

Resistance of data processing managers to allowing portions of data to leave the controlled, multiuser environment can be expected to crumble in the face of company professionals demanding "live data" for their PCs and other microcomputers. Companies that rush to join the mainframe to micro trend are likely to enjoy a competitive edge, because they can reduce the number of mainframe users during peak periods, as well as high time-share hourly fees, while increasing their computing power.

D_{ATA}
*processing centers will
have to come to terms
with the inevitable
decentralization of
computing and data
processing.*

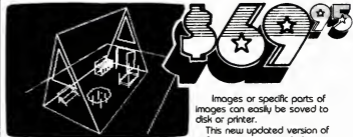
The speeding of computer expertise through industry will bring about the fifth wave of software for the IBM PC: programs specifically tailored to thousands of businesses and the millions of tasks they engage in each day. For instance, shoe store owners will have programs custom-designed for their business; magazine

writers will have programs designed to facilitate the writing, editing, and proofreading of articles; students will have powerful software to help them access educational databases for their homework projects. These developments are not as futuristic as they sound; programs to perform these and even more complex tasks

are currently being written.

These task-specific programs almost certainly will reach the marketplace in the next few years, provided a good mechanism for distribution is found. When this wave of personalized software does become available, the stage will be set for the complete computerization of society./PC

3-D ANIMATED COLOR GRAPHICS FOR



INTRODUCING PC WORLD

An amazing second generation program first featured on Tom Snyder's Prime Saturday TV Show.

It turns on IBM/PC with 96K into a sophisticated graphics system capable of creating animated, three dimensional color images and projecting them in true perspective on the screen. The image can be rotated, moved closer or further away and more!

A powerful screen-oriented text editor, is included to facilitate image formation. "Sketch" your dream house, boat, car or fantasy empire. Then view it as it would be seen from 10,000 feet or zoom in until the screen is filled with a doorknob. Go inside and move from room to room examining furniture placement as the screen rotates within the room.

Images or specific parts of images can easily be saved to disk or printer.

This new updated version of our famous program includes many features not available with the original program.

The editor uses function keys, block functions, overwrite and insert modes.

The display has nine individually controllable units, an overlay option for composite images, 3D viewpoint macro, keystroke recording for demo drivers and angle entries can now be made in degrees.

Plus other enhancements and options. Manual and tutorial files included.

For a demonstration turn into your nearest PC dealer, today!

USA

United Software of America

750 3rd AVE., NEW YORK, NY 10017
(212) 688-0347 — TELEX 640055
DEALER INQUIRIES INVITED

CIRCLE 595 ON READER SERVICE CARD

Meet Lee McFadden, your personal guide to the IBM PC

Lee's carefully sequenced cassette lessons let you learn in the most natural way possible—by sitting down with a knowledgeable friend. Even if you have never touched a computer, in just 3 step-by-step sessions you will learn to:

- Set up your computer and use the special keys
- Copy diskettes and files
- Format new diskettes
- Rename and erase files
- Load and run BASIC programs
- Write simple BASIC programs
- Create and edit text files
- Set up batch processing files
- And much more!

In short, you will be able to use existing programs with confidence, as you enter your own data, organize your files and understand the principles of what you and your computer can do. If you later decide to take up programming, you'll have the solid background necessary.

A Proven Teaching Approach

With interactive FlipTrack cassettes, you learn directly by doing. No reading required. You learn at your own convenience, at your own pace, on your own computer—like having a personal tutor "talk you through" each procedure.

Best of all, the patented FlipTrack format of the tapes lets you choose the subjects that interest you, covering as much or as little detail as you want. And a fully indexed Operator's Guide provides an invaluable, on-going reference.

You work directly with IBM's own DOS and Diagnostics diskettes, trying the



IBM is a registered trademark of International Business Machines Corp.

commands and programs you want to master, and seeing the results. No secondhand simulations. (If you have PC DOS version 2.0, you also work with its Supplemental Programs diskette.)

Moneyback Guarantee

Order from us on a 15-day "right of return" basis. Try a lesson or two yourself. Share them with others—friends, family, students or staff. If you're not delighted at how quickly and easily you begin to learn, simply return the program in its original condition for a full refund. No questions asked.

To Order:

Drop by your local dealer for a demonstration. Fill out the coupon below, and mail it. Or Visa and MasterCard holders may order TOLL FREE:

(800) 222-FLIP
in Illinois, call (312) 790-1117.

Other tested "how to" courses from FlipTrack:

Computer Operation

- ☐ Apple //e \$57.00
- ☐ Apple II Plus \$57.00
- ☐ Apple III \$110.00
- ☐ IBM PC \$57.00
- ☐ IBM XT \$75.00
- ☐ Franklin Ace 1000 \$57.00

Word Processing

- ☐ WordStar \$57.00
- ☐ WordStar & MailMerge \$75.00
- ☐ AppleWriter \$57.00
- ☐ EasyWriter II \$57.00

Spreadsheets

- ☐ VisiCalc \$75.00
- ☐ SuperCalc \$75.00
- ☐ Multiplan \$75.00
- ☐ Lotus 1-2-3 \$75.00

Operating Systems

- ☐ CP/M \$60.00
- ☐ CP/M-86 \$75.00

FlipTrack & Learning Systems acknowledges the trademarks above as belonging to the companies whose products they describe.

Learn how to operate your IBM PC by listening to a friend.



☐ YES. Please rush me the courses I've checked above. I understand that if I'm not delighted, I may return any course undamaged within 15 days for full refund. No questions asked.

☐ Check enclosed. (Include \$2.50 for shipping. Illinois customers add 5.5% sales tax.)

☐ Charge my credit card:

☐ VISA ☐ MasterCard

No. _____ Expires _____

Name _____

Address _____

City _____ State _____ Zip _____

Signature _____

Outside USA, add \$10 per unit



FlipTrack[®]
Learning Systems

Dept. PC E
999 Main, Suite 200
Glen Ellyn, IL 60137
(312) 790-1117

FlipTrack Learning Systems is a division of Mosier Media, Inc.

CIRCLE 332 ON READER SERVICE CARD

Complimentary Subscription Application

PC WEEK is a weekly newspaper covering the latest information on IBM or equivalent Personal (Micro) Computers. It is mailed free of charge to qualified individuals at business addresses.

Full company name and company address must appear in spaces below for application to be processed.

1020

Name		
Title		
Company Name		
Division	Telephone Number	
Company Street Address		
Company City	State	Zip Code

You must answer all questions to qualify.

- ☐ Please accept my request for a complimentary subscription to PC WEEK
- ☐ No, I do not want to receive PC WEEK
- The primary end product manufactured, or service performed at this location is _____
(Please be specific)

4. Your title (Check one appropriate box)

- | | |
|---|--|
| <input type="checkbox"/> 1. President/Owner/Director/Chairman/Partner | <input type="checkbox"/> 15. Director or Manager EDP/MIS Operations |
| <input type="checkbox"/> 2. Vice-President/General Manager | <input type="checkbox"/> 16. Director or Manager Information Center |
| <input type="checkbox"/> 3. Controller/Treasurer | <input type="checkbox"/> 17. Business Microcomputer Specialist |
| <input type="checkbox"/> 4. Vice-President Finance | <input type="checkbox"/> 18. Systems Analyst |
| <input type="checkbox"/> 5. Chief Accountant | <input type="checkbox"/> 19. Data Base Administrator |
| <input type="checkbox"/> 6. Vice-President Operations | <input type="checkbox"/> 20. Vice-President or Director R&D |
| <input type="checkbox"/> 7. Director or Manager of Purchasing | <input type="checkbox"/> 21. Vice-President or Director Engineering |
| <input type="checkbox"/> 8. Director or Manager of Office Systems | <input type="checkbox"/> 22. Director or Manager Plant or Production |
| <input type="checkbox"/> 9. Vice-President Sales/Sales Manager | <input type="checkbox"/> 23. Chief Engineer |
| <input type="checkbox"/> 10. Director or Manager Marketing | <input type="checkbox"/> 24. Systems Engineer |
| <input type="checkbox"/> 11. Director/Manager/Head/Chief of EDP/MIS | <input type="checkbox"/> 25. Design/Production/Research Engineer |
| <input type="checkbox"/> 12. Director or Manager Programming | <input type="checkbox"/> 26. Consultant |
| <input type="checkbox"/> 13. Director or Manager Systems & Procedures | <input type="checkbox"/> 27. Educator |
| <input type="checkbox"/> 14. Director or Manager Communications | <input type="checkbox"/> 28. If your title is other than above what is your title? |

(Please be specific)

5. Do you have mainframe computers and minicomputers on site at this location?

- ☐ Yes (If yes, please fill in below for the two largest.)
☐ No

Manufacturer	Model	Qty

6. Do you currently have Personal (Micro) Computers on site at this location?

- ☐ Yes (If yes, please indicate total _____ and provide manufacturer's name and quantity below.)
☐ No

Manufacturer	Qty	Manufacturer	Qty

7. Are you PLANNING to purchase Personal (Micro) Computers within the next 12 months for this location?

- ☐ Yes (If yes, please indicate total _____ and provide manufacturer's name and quantity below.)
☐ No

Manufacturer	Qty	Manufacturer	Qty

8. The Personal (Micro) Computers purchased for this location would be

- ☐ For internal use ☐ For resale
☐ Other _____
(Please specify)

9. Please indicate below the communications capacity of the aforementioned Personal (Micro) Computers

- ☐ A. Communicate with remote timesharing or database
☐ B. Communicate with internal mainframe or minicomputer
☐ C. Used in local area network.
☐ D. Down load data from mainframe or remote service
☐ E. None of the Above

10. Please indicate below the products and services that you help acquire, recommend, specify, or approve (Check all that apply)

Computers

- ☐ 1. Mainframe
☐ 2. Minicomputer
☐ 3. Personal (Micro)
☐ 4. Stand Alone
☐ 5. Multuser
☐ 6. None of the Above

Peripheral Equipment

- ☐ 7. Letter Quality Printer
☐ 8. Graphics Printer
☐ 9. High Speed Printer
☐ 10. Color Monitor
☐ 11. Monochrome Displays
☐ 12. Modems
☐ 13. Hard Disk
☐ 14. Tape Backup System
☐ 15. CP-Compatibility Card
☐ 16. Memory Board
☐ 17. Communications Port
☐ 18. Plotters/Charting Devices
☐ 19. Local Area Networks
☐ 20. None of the Above

Software Packages

- ☐ 21. Communications
☐ 22. Accounting
☐ 23. Order Entry Inventory

- ☐ 24. Payroll
☐ 25. Time Billing
☐ 26. Financial Planners/Spreadsheet
☐ 27. Project Managers
☐ 28. Word Processors
☐ 29. Compilers
☐ 30. Database Managers
☐ 31. Program Developers
☐ 32. Business Graphics
☐ 33. None of the Above

Outside Services

- ☐ 34. Maintenance
☐ 35. Education Training
☐ 36. Software Systems Design
☐ 37. Remote Computing
☐ 38. Database Services
☐ 39. Other
☐ 40. None of the Above

Expendables

- ☐ 41. Liskettes
☐ 42. Stock Paper
☐ 43. Forms & Other Consumables
☐ 44. None of the Above

11. Are there any others at this location that would qualify for a complimentary subscription to PC WEEK?

Name _____ Title _____

Name _____ Title _____

Name _____ Title _____

Name _____ Title _____

Name _____ Title _____

Your

Signature _____

Your

Title _____

Date _____

Please be sure to sign your name and list your actual title above

FOLD HERE

Seal or tape all edges for mailing—do not use staples



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 3838 NEW YORK, N.Y.

Postage will be paid by addressee

100 WEEK

One Park Avenue, Room 448
New York, N.Y. 10016



Seal or tape all edges for mailing - do not use staples

FOLD HERE

ANNOUNCING



WEEK

News relating to the use of IBM Personal Computers in DP/MIS and other multiple unit environments.

Volume 1 Number 2

August 1, 1983

\$2.95 a copy, \$12.95 a year

Portables Catch On In Corporate World

IBM's new 286-based portable computers offer a new way to do business. They are fast, easy to use, and can be used in a variety of environments. They are also portable, which means they can be used in the field. This is a major advantage for businesses that need to be able to access their data from anywhere. The new 286-based portables are also more powerful than previous models, which means they can handle more complex tasks. This makes them a more attractive option for businesses that need a portable computer. The new 286-based portables are also more reliable than previous models, which means they can be used in a variety of environments. This is a major advantage for businesses that need to be able to access their data from anywhere. The new 286-based portables are also more powerful than previous models, which means they can handle more complex tasks. This makes them a more attractive option for businesses that need a portable computer. The new 286-based portables are also more reliable than previous models, which means they can be used in a variety of environments. This is a major advantage for businesses that need to be able to access their data from anywhere.



IBM's new 286-based portable computers offer a new way to do business. They are fast, easy to use, and can be used in a variety of environments. They are also portable, which means they can be used in the field. This is a major advantage for businesses that need to be able to access their data from anywhere. The new 286-based portables are also more powerful than previous models, which means they can handle more complex tasks. This makes them a more attractive option for businesses that need a portable computer. The new 286-based portables are also more reliable than previous models, which means they can be used in a variety of environments. This is a major advantage for businesses that need to be able to access their data from anywhere. The new 286-based portables are also more powerful than previous models, which means they can handle more complex tasks. This makes them a more attractive option for businesses that need a portable computer. The new 286-based portables are also more reliable than previous models, which means they can be used in a variety of environments. This is a major advantage for businesses that need to be able to access their data from anywhere.

The first newspaper designed to give top level management the latest IBM Personal Computer news and analyses—up to 2 months faster than any monthly publication.

Finally, a newspaper that keeps up with the rapidly-changing developments in the IBM Personal Computer marketplace for today's busy executive. PC WEEK is the first and only weekly newspaper to offer the news of a tabloid and the features and analyses of a monthly publication. Which means you get the news you need to make important business decisions . . . up to 2 months faster than any other publication.

PC WEEK delivers the latest breaking stories—as they develop. Unlike monthly magazines, which require almost 2 months lead time to publish a story, PC WEEK follows and reports the news up to 48 hours before publication. So you learn what's new *when* it's new.

PC WEEK updates the research, analyzes the strategies, reviews the hardware and software releases, offers insights on future industry concerns, relates the timely information you need to help

make you more productive.

Here are just some of the features and departments you'll get each and every week in PC WEEK . . .

- **News:** PC WEEK brings you analytical reports on the major topics of the day. Trends are analyzed, product announcements and company changes put into perspective.
- **Strategies:** Each week, you get an in-depth profile of a leading user company and how it handles the Personal Computer. Case studies tell why an application succeeded or failed.
- **Software Review:** What packages are right for you PC WEEK compares and analyzes important releases . . . tells you how to use them effectively.
- **Hardware Survey:** A business-oriented buyer's guide and
- **a product directory detail the features of product classification and give you the technical and financial considerations involved.**
- **DataComm Lines:** How to communicate with other Personal Computers . . . without the jargon . . . without the confusion.
- **Data Base Report:** We'll examine outside data bases, such as the Dow Jones News Retrieval Service, and tell you how to access them to increase your efficiency.

Now, you won't have to wait for the news you need. You can get it first . . . with PC WEEK.

All this and more is yours in each issue of PC WEEK. Best of all, your subscription is complimentary, if you qualify. So take a moment to complete and mail the qualification form at the right.

PC WEEK

Because you need fast-breaking news as it breaks.

Ziff-Davis Publishing Company, 381 Elliot Street, Newton, MA 02164 617-965-8850



PALANTIR™ WORD PROCESSING

WE DON'T HAVE TO BEEF UP OUR GUARANTEE WITH A LOT OF BULL

Other software companies give you disclaimers. Palantir gives you a real guarantee: Palantir backs its software with 90 days of free phone support via a toll-free number. When you call, we won't tell you to ask your dealer or read your manual; we'll answer your question, free of charge. If we can't solve your problem, we'll replace your Palantir Software with any competitive software of comparable value.

We couldn't make an offer like this if we weren't confident about Palantir word processing. It's easy to learn, easy to use, easy to live with.

Palantir word-processing software is designed for microcomputers. Yet it gives you all the features of a dedicated word processor. You won't find a better system on the market today.

To find out more about Palantir software, mark the reader-service card

in this issue or call, toll-free: 1-800-368-3797. In Texas, call 713-520-8221.

We'll respond with detailed information on Palantir software and a free "No Bull" button. A closer look will convince you that we're not just one of the herd. And that's no bull.



Palantir Software 3400 Montrose Blvd. Suite 718 Houston, Texas 77006

™ Palantir is a trademark of Palantir, Inc.

CIRCLE 188 ON READER SERVICE CARD

Meet the Competition.

Peachpak™ or The Accountant™?
There really is
no comparison.

When you're looking for integrated accounting software, you want a package that you can afford now, that will cover your present needs and will easily adapt to your future requirements.

Meet The Accountant. Here is a Peachtree™ compatible software package that will do everything the Peachpak will do and more, much more — for less money.

The Accountant is easy to learn and use. It is completely menu-driven and includes sample data files to help you get up and running — fast.

Read the chart below, then call us for our information packet. See why we say:

No Comparison:

FEATURE	THE ACCOUNTANT	PEACHTREE SERIES 4
All programs available from menus	✓	
Supports upper/lower case	✓	
Maximum accounts	Limited only by disk space	800
Hard disk support	✓	
Includes payroll	✓	
Mailing labels (A/R & A/P)	✓	
Service charges (A/R)	✓	
Full printer support	✓	
Compatible *	✓	✓
Technical hotline	✓	
PRICE:	\$365.00	\$595.00

Insoft, Inc. ■ 10175 S.W. Barbur Blvd., Suite 202B ■ Portland, Oregon 97219 ■ 503/244-4181

Peachtree and Peachpak are trademarks of Peachtree Software, Inc.
The Accountant is a trademark of Insoft, Inc.

\$365

THE ACCOUNTANT
General Ledger
Accounts Receivable
Accounts Payable
Payroll

APPLE II
IBM PC

Note to current
Peachtree Series 4 owners:
Your data files will
work with the Insoft
Accountant Package to
make upgrading easy.

insoft®

*IBM version only

CIRCLE 288 ON READER SERVICE CARD

WE TURN YOUR IBM P.C.* INTO A SMART TERMINAL.



You don't really need to get your hands dirty to turn your IBM PC into a DEC VT100 and VT52 compatible intelligent workstation. All you need is VTERM, Saturn Consulting Group's terminal emulation software. VTERM's features include full VT100 keyboard and video emulation,

throughput to 9600 baud, printer support, and PC-Host file exchange, in addition to the standard capabilities of an asynchronous communications package. Call or write today. Our software mechanics are standing by.

*Also available for the TI Professional

Coefficient Systems Corp. (212) 777-6707 611 Broadway, Suite 426B, New York, N.Y. 10012

Formerly Saturn Consulting Group Inc.

CIRCLE 397 ON READER SERVICE CARD



SORRY CHARLIE!



If you just bought a 16-bit PC with one 160K drive, 128K RAM, MS-DOS, a word processor and an electronic spreadsheet, you're going to be sorry you read this ad. Why? Because Scottsdale Systems (with considerable help from Sony) is now providing all this and more with the PC Plus or PC995! In addition, we will pretest your PC Plus system, make user copies of your software and include your choice of an Amber or Green monitor.

Nor only is the Sony PC Plus priced less than one-third that of a comparably equipped IBM PC. It is also less expensive than most 8-bit computer packages. The PC Plus will run most software developed for the IBM PC. It features expansion slots and is backed by over 50 Sony service centers nationwide.

Plus - Thanks to its brushed, stainless-steel finish, the Sony PC Plus looks more expensive, yet takes up less space.

Quantities are limited. Give us a call and we will place your name on the "call-back" list in the order it came in, and provide additional information and prices. Better safe than sorry!

PC Plus™
PC Deluxe™

\$995
call

TELEVIDEO



New from TeleVideo! The TeleVideo 1603 features a 14" green screen, dual floppy, two serial ports, 128 K (expandable), CP/M and MS-DOS, and even a Mouse port. Local service available via Xerox (additional charge).

TeleVideo 1603 \$2300
Call for prices on other TeleVideo Systems.

ZENITH



Now low prices on the systems that are 3-100 16 bit 8-bit CP/M and MS-DOS compatible. Plus they're backed by Zenith service virtually everywhere. The Z-100 features two built-in 5 1/4" drives, 128K RAM, and 223kbit graphics. Adds 13" RGB 216k 135 monitor to system for superior color graphics.

ZF-120-22 \$2799
ZF-110-22 \$2699
ZW-110-22 (11 MB) \$4849
ZW-135 \$479

COLUMBIA



It's the 38 LBS. compatible portable with a 7" green built-in screen, dual 320K drives, and MS-DOS, CP/M 86, Basics. The Perfect series, and more additional free software than we have room to list. Plus, they're backed nationwide via Bell & Howell.

Columbia VP \$2349

ACCESSORIES



HOUSTON INSTRUMENTS

DMP-29 \$1795
DMP-40 \$745
DMP-41 \$2340
DT-11 \$677

QUADRAM

64K Quadboard \$269
256K Quadboard \$419
Quadlink \$489

HAYES

Smartmodem (300) \$210
Smartmodem (1200/300) \$514
Smartmodem 1200B w/Smartcom \$439

Scottsdale Systems Ltd.

617 N. Scottsdale Road, Suite D, Scottsdale, Arizona 85257

(602) 941-5856

Call 8-5 Mon.-Fri.



We participate in arbitration for business and customers through the Better Business Bureau of Maricopa County.

SERVICE/ORDERING

INTEGRATION: Prices listed are for new equipment in factory sealed boxes with manufacturer's warranty. We will pretest your equipment, integrate your system, configure your software, provide special cables, etc. for an additional charge. Call for prices.

ORDERING: MAIL ORDER ONLY. Prices listed are for cash. No C.O.D.'s. We sell on a Net 30 basis to Fortune 1000 companies and Universities with good credit. P.O. charge cards add 2% A/E. Residents add 6%. Prices subject to change, product subject to availability. Personal checks take 3 weeks to clear. 0-20% remittance fee for returned merchandise. Shipping extra: products are F.O.B. point of shipment. CP/M and MP/M are registered trademarks of Digital Research. Wordstar is a registered trademark of MicroPro International. IBM and IBM PC are registered trademarks of International Business Machines Corporation.

SOFTWARE: Sold only w/systems, not warranted for suitability.

PRINTERS



We have PC cables

Gemini 10X \$268
Gemini 15X call
NEC6023A \$396
Tally 160L/trac \$584
Tally 160L/trac \$799
Infomaster Riteman \$339
IDS Microprint \$509

HIGH SPEED

Anadex 9620A \$1399
Qonrex 7000 \$1562
TI-810 \$1285
Pitman 132 "loaded" \$1469
Pitman 60 "loaded" \$1369

LETTER QUALITY

Sony PR3500 call
Silver Reed 550 \$654
550-Serial \$693
DTC-360Z call
NEC 7710 \$2099
Silver Reed 500 \$555

OKIATA



The new Microline 92's and 93's feature 140 C.P.S. draft mode, 40 C.P.S. correspondence mode. Standard parallel, Plug and Play for IBM add \$32.

Microline 92 \$489
Microline 82 \$489
Microline 90 \$489
Microline 84 \$489

NEC 3550

It's the Cadillac of letter quality printers designed specifically for the IBM PC. In-directional, 38 c.p.s. Nationwide service available via Dow Jones.



\$1795

CTC Quick Disc... A Totally New Kind of Drive for Your PC

Realize up to 1000% improvement in PC* run time performance. Disc intensive applications on the PC are accomplished at main frame speeds.

The CTC Quick Disc is a self-contained solid state turbo charger designed to permanently store often used data for instant access (512 Bytes|.001 Sec.). It can easily be configured to provide **true** cache buffering for any number of other drives and simultaneously provide permanent data storage as an emulator. Plus, a portion of its memory can be allocated as a printer buffer when needed.

An independent power supply with battery backup plus error detection and correction provide near fail-safe file security.

Plain and Simple, it's a computer for your computer that cuts hours from every computing day.

Quick Disc models are available from 128K to 1 MB. In the cache mode these will buffer 10 MB to 80 MB's of data.

*Currently available for the IBM-PC, IBM-PC/XT and most compatibles with MS DOS 1.1 or MS DOS 2.0 operating systems.

For additional information see your local computer dealer or contact CTC directly for the dealer nearest you.

 **CTC
ELECTRONICS**
Division of Communications Technology Corp.
2237 Colby Ave., Los Angeles, CA 90064
(213) 477-4263



See us at
COMDEX Fall '83

With emulation software and hardware, the PC can pass for a DEC VT-100 or IBM 327Q terminal or any of a host of other devices.

Multiple Personalities: Emulation With The PC

Does your PC read and write EBCDIC? Does it act like a DEC VT-100, an IBM 3270, or 3780 terminal? Does it speak Bisync or X.25 with the correct accent? If not, it will be turned away at the frontier's of DEC and IBM, where powerful mini and mainframe computers reside, feasting on ambrosial databases, instantaneously communicating with one another and with microcomputers throughout the world.

Your PC possesses protean abilities. Not only can it communicate with an IBM-3270, it can also pass for a DEC VT-100, and HP 2621, or any of a host of other devices, which might include such hardware as a CRT, a telephone, a printer, a modem, a disk drive, or a computer. The ability to imitate other machines is called emulation. The PC's emulation capabilities enable it to perform tasks that would otherwise require expensive devices that

often overlap in their capabilities.

Emulation can be achieved through software or hardware, which translates codes from the device being "imitated." The PC, therefore, is more powerful than any single device; when emulating something else, it can assume another machine's capabilities, while the emulated machine's capabilities remain fixed.

For instance, there are many large applications programs running on IBM Digital, DEC, Honeywell, and HP minis and mainframes, which assume that they are connected to the appropriate IBM, DEC, or HP device. Unless the correct device is provided or emulated, these programs won't run. So, by "imitating" an IBM, DEC, or HP device, the PC has access to thousands of software applications the computer would otherwise be unable to use. The device imitated by the PC might be a CRT terminal, a graphics terminal, a

cluster controller, or a printer.

Many IBM mainframe operating systems assume IBM 3270 or 3780 terminals are attached to the mainframe. With emulation software IBM PCs can replace these terminals as Remote Job Entry stations, and the PC can share mainframe's worldwide communications capability.

What Can Be Emulated?

In the myriad of emulation products available for the PC, you'll see roughly three types of emulations: asynchronous, synchronous, and both.

- Asynchronous CRT emulations are usually software-only products and require that you have an asynchronous serial port and a modem. Some of the terminals emulated by these products are DEC VT-52/100, IBM 3101, HP2621, Tektronix 4010, Lear-Siegler ADM 3A, and Data General D100. Terminals such as these are com-



Realcolor isn't just for colors. You can take advantage of your IBM monochrome monitor to get high resolution 640 x 348 B & W graphics. With Realcolor's graphics character set you can have text and graphics simultaneously. And when you buy a color monitor in the future, Realcolor will support your choice whether they're analog RGB, digital RGB or composite displays.

- Analog Mode:** Border, foreground and background registers select from a range of 512 colors using two 16 register maps.
- Digital Mode:** Border, foreground and background registers select from the I.B.M. 16 color range using two 16 register maps.
- I.B.M. Modes:** 640 x 200 2 color graphics, 2 pages.
320 x 200 16 color graphics, 2 pages.
Alpha modes are displayed on a graphics screen.
- Expanded Modes:** 640 x 200 4 color graphics, 1 page.
320 x 200 16 color graphics, 1 page.
Telidon - NAPLPS compatible display.
- B&W Modes:** 640 x 348 graphics on the IBM monochrome display. Alpha modes are displayed on a graphics screen.



MICRO DEVELOPED SYSTEMS INC.
P.O. BOX 38
BURLINGTON, ONTARIO, CANADA
L7R 3X8
(416) 844-1781

monly used with minicomputers and may be used with mainframes, given the proper software and hardware adaptations on the mainframe. Since they are software-only, these products are cheaper than the other types. Most will allow file transfer of text files but not of EXE or COM files.

• Synchronous emulations all rely on synchronous communications boards, which are usually supplied with emulation software. In many cases, the software is multifunction; i.e., several terminals can be emulated, both synchronous and asynchronous. Some products include on-board modems, and some include an on-board microprocessor dedicated solely to communications and emulations, which frees the PC's processor for other tasks. In most cases, the emulations will allow both text and EXE/COM file transfer between the PC and the host computer.

To use these emulators, you may need a synchronous modem in addition to the emulation product. These modems cost upwards of \$1500 and may require a special telephone line for high speed (4800 to 9600 baud) communications. Devices emulated by these products include IBM 5251, 2780, 327x series and 378x series display terminals, 3276 cluster controllers, and 3287 printers.

Many synchronous emulation products also give the PC the ability to communicate in various synchronous and network protocols such as Bisync, HDLC, SDLC, SNA, and X.25.

Cost Economies

There is a simple explanation for the explosion of emulation products for the PC: saving money.

If the PC can replace one or several terminals, and still be used for spreadsheets and word processing, it is much cheaper than a terminal that can only be used as a terminal. It is cheaper still if the PC can be made to function like several different terminals.

Many large and small companies already have large numbers of PCs sitting on desks. To get the most from their investments and to save desk space, the PCs can perform double duty as terminals or other devices; emulation is preferable to investing in hardware that may be obsolete next year. The PC, which performs its emulations with software or minimal hardware, has far less built-in obsolescence than a typical CRT terminal. Figure 1 shows some cost comparisons. (Prices assume you already own a PC.) These are rough estimates, and most of the PC emulations leave out some features of the device being emulated. But the fact remains: If you're looking for the basic functionality of the device, emulating it on the PC is considerably cheaper than buying, leasing, or renting the device itself.

Most PCs communicate in a mode called "asynchronous." The asynchronous modems available today cannot send or receive more than roughly 120 to 130 characters per second (1200 baud), and probably are limited by design to about a 260 to 270 character-per-second (2400 baud) transfer rate. Synchronous communications, however, allow much higher data transfer rates—up to 1200 characters per second (9600 baud). Coming increases in long-distance phone rates will make this speed improvement even

Revelation™ Data Base for IBM PC & XT \$950

Large System Relational Database
now available for IBM PC

- Variable length records
Up to 65K in length
(That's right—65,000 characters)
- Dictionary driven files & reports
- 8087 compatible for superior number crunching
- Report writer with many levels of sort
- Data compatible with Pick™ operating system menu
- XT compatible - handles files as large as the disk
- MS DOS compatible
- IBM PC, Columbia, Eagle, Compact, Hyperion, etc. compatible
- Many more features
- 32 bit technology, not old fashioned 8 bit technology
- More powerful than most mainframe data bases

MergeCalc™ \$125

- Consolidates VisiCalc® spread sheets
- Compares two or more VisiCalc® spread sheets

Applications MergeCalc merges VisiCalc® files and extends the utility of VisiCalc®. One of the shortcomings of VisiCalc® is the inability to consolidate, merge or manipulate multiple VisiCalc® models automatically. With MergeCalc, you can perform operations between your models without changing the models in any way. MergeCalc is ideally suited to add segments of a total business into a consolidated model. This enables all types of complex analyses, such as variance analysis, percentage change reports, time change reports, share of market analysis, incremental sales or investment analysis.

LoadCalc™ \$95

- Converts textfiles to DIF™ files
- Applications: LoadCalc creates DIF files from textfiles, so you can move mainframe or minicomputer data into VisiCalc®, Visi-Trend/Plot, VisiWord or any program that uses DIF. LoadCalc allows selective conversion of the data, so you only get what you want. No programming required. With LoadCalc you can load "Actuals" from the mainframe into your "Budget" spreadsheet and compare the numbers.

Send me a catalog! PC11

CYPHER, 121 Second St., San Francisco, CA 94105

NAME _____
COMPANY _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____

800-SMARTWARE

Visa/MC accepted

In California 415-974-5297

VisiCalc® is a registered trademark of VisiCorp.
CIRCLE 206 ON READER SERVICE CARD

Figure 1: Comparative costs for devices and PC emulation products for that device.

Additional cost for	PC plus emulation product	New device
DEC VT-100	\$125	\$2000
IBM 3276 Control Unit Display Station	\$690	\$5,750 or \$189/mo (lease)
IBM 3780 Data Communications Terminal Basic Unit	\$895 (does not include printer, card reader, card stacker, or card punch)	\$22,760 or \$1,181/mo (lease)

(800) 292-3360
TOLL FREE IN CALIFORNIA

(800) 292-3360
TOLL FREE OUTSIDE CALIF.

"WHY PAY MORE"

COMPARE THESE PRICES

MC-P APPLICATIONS

Brings Software & Hardware At Unbeatable Prices

SOFTWARE

	LIST	OUR
ASHTON TATE		
dBase II w/users guide	\$700	\$415
Financial Planner	700	452
CONTINENTAL		
Home Accountant	150	105
Property Management	495	327
EMERGING TECHNOLOGY		
Edix/Wordix (either)	135	
FOX & GELLER Quick Code	295	189
HOWARDSON		
Real Estate Analyzer II	250	175
Tax Preparer	250	175
LIFETIME		
Voicemail	195	129
LOTUS - 1-2-3	495	329
MICROPRO		
Word Star	495	295
Spill Star	250	162
Mail Marga	250	162
Data Star	295	176
Super Sort	250	149
Calc Star	145	86
Info Star	495	320
Report Star	350	221
MICROSTUFF Crosstalk	195	129
MICROSOFT		
Multi Plan	275	180
Flight Simulator	50	35
PBL CORPORATION		
Personal Investor	145	98
PEACHTREE Peach Pack	595	325
PFS CORPORATION		
Pfs File	140	94
Pfs Report	125	84
SORCIM		
SuperCalc II	295	185
Super Writer	295	205
SYNAPSE File Manager	150	97
VISICORP		
Visicalc	250	189
Visifile	300	225
Visi/Trend/Plot	300	225
Visi/Schedule	300	225
VisiWord w/free VisiSpell	375	285
Desk Top Plan I.	300	225

LOTUS 1-2-3

\$329⁰⁰

dBASE - II

\$415⁰⁰

WORD STAR

\$275⁰⁰

EDIX/WORDIX

\$129⁰⁰

MULTIPLAN

\$180⁰⁰

TANDON TM100-2

\$239⁰⁰

OKIDATA 92

\$535⁰⁰

AMDEK COLOR II

Hi Res RGB

\$455⁰⁰

AST MEGA PLUS 64K

\$315⁰⁰

NOVATION J-CAT

\$115⁰⁰

HARDWARE

	LIST	OUR
HAYES MICROCOMPUTER PRODUCTS		
Stack Chrono (RS-232)	\$249	\$185
Stack Smart Mod (RS-232)	289	219
Smart Mod 1200 B (IBM)	599	459
MICROSOFT		
64-K Ram Card (IBM)	\$350	249
256-K Ram Card (IBM)	875	620
NOVATION		
J-Cat	149	115
Smart-Cat 103/212	595	445
Smart-Cat 103	249	187
KRAFT & TG JOYSTICKS	70	49
ELECTRONIC PROTECTION DEVICES		
Orange	140	99
Peach	98	69
AST RESEARCH		
Megaplus 64K	395	315
QUADRAM		
Quadboard 84K	395	295
Quad 512 + 64K	325	245
Quadlink	680	525
TANDON		
TM 100-2 Drive	395	239
PRINTERS		
Daisywriter 2000	1395	1185
Epson FX 100		745
IBM Parallel Printer Cable	50	37
Mennesman Tally MT 160L	798	669
Mennesman Tally MT 180L	1098	925
NEC 7730 RO Parallel	2595	2295
OkiData 92	899	535
Qume 1140 plus	1685	1525
MONITORS		
Amdek MAI Board	599	499
Amdek 12" 310A	230	185
Amdek Color II RGB Hi-Res	529	455
Hercules Graphics Card	499	375
Koalis Touch Pad	125	95
Princeton RGB Hi-Res	795	519
Quadchroms 17"	695	525
USI P13	249	165

CALL FOR OTHER SOFTWARE & HARDWARE PRICES
"International Dealer Enquiries Welcomed"

MC-P APPLICATIONS

111 W. St. John St., Suite 307
San Jose, CA 95113 Phone (408) 293-3360
Telex: 294207 MCPA UR
HOURS: 9 a.m. to 5:30 p.m. — Mon. — Sat.
(Phone Orders Only on Sat.)

TERMS: All prices subject to change. Cashier's check/MO / Bank Transfer. Allow time for company or personal checks to clear. Prices reflect cash prepaid discount. VISA/MASTER CARD/COD/PO's -3%. California residents add sales tax.
SHIPPING: \$4 per item for UPS surface (\$8 for Blue Label); Monitors \$20, Printers \$25, within continental USA.

more desirable than it is now. If a doubling of transmission speed means having the time connected, use of synchronous communications can pay for itself very quickly. On the other hand, if the amount of information going back and forth on the line is relatively independent of the connect time, as in most interactive programs, the baud rate has little effect on the length (and cost) of the call.

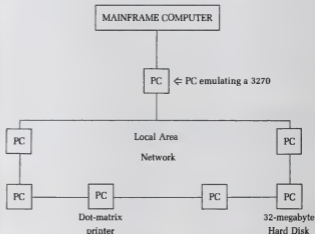
Both the asynchronous and synchronous emulation products give a single PC (or group of PCs and/or IBM terminals) the ability to communicate with and share files with a mini or mainframe. The network connection products have a different purpose: to enable multiple PCs and peripherals to communicate and share resources with one another. This does not mean that any one of the PCs in this network could not also be connected to a mainframe or a mini through a synchronous connection. It does mean that synchronous connection, or any other connection, is accessible to any PC in the network [see Figure 2].

In such an arrangement, any of the PCs in the network can use the 3270 emulation facilities installed on a single PC, as well as the hard disk and printer facilities that belong to the network. These resources can be distributed among all the PCs without duplicating the hardware investment in 3270 emulation, printer, or hard disk.

DISTRIBUTED processing networks are managers that divide work among all available resources.

Emulation can be employed in a "distributed processing network," where tasks are distributed among all the computers and peripherals attached to the network, offering much more than simple communications. Programs on one network computer can run and communicate with programs on any other network computer. Files or peripherals attached to any device in the network are potentially available to any other device. Distributed

Figure 2: In a network the PCs have access to the mainframe computer through PC emulation.



COMPARÉ II

High performance differential text analyzer!



Writers! Researchers! Lawyers! Engineers! Programmers!
Use highly rated COMPARE II. Cut text analysis from hours to minutes!

- ▶ PC-DOS, CP/M-86 or CP/M 2.2
- ▶ Scans by word or by line
- ▶ Fast New Algorithm, No file restrictions
- ▶ You can customize for word processor, printer width, file defaults, specific work flow, computer languages, different highlighting techniques
- ▶ Clear commands, Numerous formatting options
- ▶ Can generate new document with change bars

Specify When Ordering: Operating System, Computer Type and Disk Format. Free brochure and nearly free demo disk available

COMPARE II
Demo Disk (credits to purchase)

\$145.00
\$12.95

SOLUTION
TECHNOLOGY, INC.

"We Deliver Productivity"

1499 Palmetto Park Road
Suite 218
Boca Raton, FL 33432
305/368-6228

PC-DOS and CP/M are trademarks of IBM and Digital Research, respectively.

Check or COD. Florida residents add 5% sales tax. Dealer and Distributor inquiries welcome.

processing networks are "managers" that divide work among all available resources.

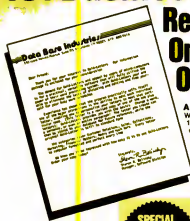
IBM has a long-range plan called Systems Network Architecture (SNA) to tie together all its computers, printers, card readers, and terminals into one large distributed network. DEC, Wang, and most of

the other major manufacturers also employ methods to do this. There is even an international standard, CCITT Recommendation X.25 being used in Europe, which defines a series of protocol levels. Each of these network plans relies upon some lower-level building blocks for simple communication. Communication pro-

PROGRAMS
on one network
computer can run and
communicate with
programs on any other
network computer.

101 Business Letters

**Ready to Use...
On Disk...
Only \$159.⁰⁰**



A great idea for any business...large or small!
Well written, professional business letters covering 12 categories are now available on disk, which can be easily accessed by most any word processing program. Not only do you not have to write the letters, you don't even have to type them! They're all ready to go
• works with most any word processing program • available in CP/M, MS/DOS, PC/DOS • 12 letter categories 101 letters in all • easily modifiable for your needs
• well written and letter perfect • letters automatically loaded to your word processor

Phone in your order
call toll free
1-800 922-5555

Total technical support provided for Gold Letters. Checks, money orders, CDS or accepted Visa or MasterCard in writing or by phone. \$5 for shipping. CA residents add 6% tax. Outside add \$15.

Letter Listing

- 9 credit letters
- 4 marketing letters
- 13 customer relations letters
- 9 employee letters
- 12 contracting products letters
- 6 follow up letters
- 9 sales letters
- 4 media letters
- 7 collection letters
- 2 sympathy letters
- 9 services letters
- 4 procurement letters
- 21 other business letters

Data Base Industries

330 W. Felicita Ave., Suite D
Escondido, CA 92025 619/480-9616

**SPECIAL
Gold Letters
and WordStar[®]
\$495.⁰⁰**

Yes, send me _____ copies of Gold Letters for \$159 each
Enclosed is \$ _____

Name _____
Company _____
Address _____
City/State/Zip _____
Telephone _____

Mail to:
Data Base Industries
330 W. Felicita Ave., Suite D
Escondido, CA 92025
619/480-9616

VISA/MC # _____
Exp. _____

CIRCLE 176 ON READER SERVICE CARD

tools such as lower-level building blocks for simple communication. Communication protocols such as Bisync, HDLC, and SDLC enable the mainframe to communicate with the PC through codes. These lower-level building blocks are available now on the PC and serve as the foundation for more sophisticated communications.

You may have no need to connect to a worldwide distributed network but still wish to connect the computers, laser printers, copy machines, and telephones in one building. Such systems are called Local Area Networks (LANs), because they do not attempt to haul large quantities of data over long distances. Their purpose—to share resources—is basically the same as that of the larger networks.

While your office may have only one letter-quality printer and one hard disk, any of the 30 PCs attached to the (LAN) can use those resources with no conflict, as if they were attached to that PC alone. Any of those 30 PCs might run a program on any of the other PCs, as if they were extensions of itself. LANs allow for a great increase in use of resources and a commonality of data, which doesn't exist when each PC has its own floppies with data stored in a particular way. LANs themselves do not require PC emulation products, but in order to use them most effectively, emulation is usually employed. Emulation allows the data from the outside world to be used in the network.

Currently there are many LANs available on the PC: Omninet, PCnet, to name a few. But the LAN with the greatest industry support appears to be Ethernet, backed by Intel, DEC, and Xerox. Ethernet interfaces are available for the PC from several vendors.

You may also avoid emulation entirely by placing different devices on the LAN.

rather than using PC emulations, Apples, Radio Shacks, Corvus Concepts, and other micros may be linked on one Omninet LAN, for example.

There are several Ethernet LAN products now available, as well as other, less expensive LANs. One original approach is Technical Analysis Corporation's Ima-line, which uses phone-line sharing to implement networking. (For more on networking and detailed description of an Ethernet product, see "Let There Be Ethernet!" PC, Volume 1 Number 11.)

Where Should Work Be Done?

The first emulation products available for the PC were simple programs that emulated DEC VT-100s or IBM 3101s. The programs are simple because they translate characters with particular functions (e.g., clear the screen, erase a line) to the DEC VT-100 or IBM 3101 into the appropriate actions on the PC screen. When you wanted your PC to look like a VT-100, you just ran the program. Many of the asynchronous emulators still fall into this category of discrete software emulations. When run, they install themselves in memory and stay there, intercepting all characters to the screen and from the keyboard, until they are told to stop.

Later, emulations were included as part of other products. The Xedex Baby Blue CPU board added Televideo 950 emulation to CP/M-80 so that WordStar,

DEC VT-100, the Televideo 920, and other terminals.

Operating systems vendors took a different approach, saying that the proper place for emulations was in the operating system itself. Digital Research released CP/M-86 with IBM 3101 emulation included, IBM, on the other hand, provided

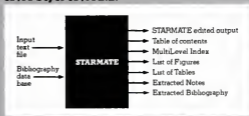
for device drivers in PC-DOS 2.0, which can be used to make the PC emulate any device or group of devices. IBM even provided a sample device driver on the DOS 2.0 system disk, called ANSI.SYS, for an ANSI standard terminal (a VT-100).

Of these three approaches to emulation—standalone emulation, emulation

Get more than WordIndex for less \$!

STARMATE

Users get high speed document finishing for WordStar with STARMATE under PC-DOS, CP/M-86, or CP/M 2.2.



Writers! Researchers! Engineers! Cut document makeup time from hours to minutes!

- ▶ Multi-Level Table of Contents
- ▶ Multi-Level Index
- ▶ Lists of Tables and Figures
- ▶ Numbers Paragraphs (1.2, 1.3, etc)
- ▶ Prepares Footnotes
- ▶ Prepares Bibliography
- ▶ Clear commands, Numerous formatting options
- ▶ Reads documents with nested files

Specify When Ordering: Operating System, Computer Type and Disk Format. Free brochure and nearly free demo disk available.

STARMATE

(Special Introductory Price)

Demo All Disk (credits to purchase) . . . \$12.95

\$145.00

SOLUTION
TECHNOLOGY, INC.

"We Deliver Productivity"

1499 Palmetto Park Road
Suite 218
Boca Raton, FL 33432
305/368-6228

WordStar, PC-DOS and CP/M are trademarks of
MicroPro, IBM and Digital Research respectively

Check or COD. Florida residents add 5% sales tax.
Dealer and Distributor inquiries welcome.

CIRCLE 422 ON READER SERVICE CARD

NOT ONLY CAN the PC screen be made to emulate a terminal, but the PC memory can be made to emulate a disk, and the IBM printer can be made to emulate a different printer.

which hadn't yet been made available under PC-DOS, would run on the PC under CP/M-80. Crosstalk, a communications product, included emulations for the

as part of another program, or emulation built into the operating system—the less, for several reasons, is most attractive. First, it can be used with any other program and takes up very little memory (about 600 bytes for ANSISYS). Second, it is less likely to cause interference with other programs. Third, it is a very general method. Not only can the PC screen be made to emulate a terminal, but the PC memory can be made to emulate a disk, and the IBM printer can be made to emulate a different printer.

Considering the advantages of device drivers over other methods, it's hard to understand why there are none available. Perhaps the vendors of stand-alone emulators are now busily converting their products to device drivers. Or perhaps IBM will surprise us with a collection of 25 oldie-but-goodie device drivers.

Giving the PC More Power

When it comes to synchronous emulations, the PC needs more power to carry out the task in so little time. Not only must

characters be translated into octets on the PC, but bits must be pecked and unpecked, data must be checked, and EBCDIC must be converted to ASCII.

I F YOU NEED a bit more zip in your PC, consider one of the co-processor products.

These various tasks must be done quickly, since synchronous data is coming in at a rate of up to 9600 baud. Most manufacturers of synchronous emulation products use additional hardware to off-load some of this work from the PC. The Zilog S10 chip, which supports Bisync, HDLC, and SDLC protocols on-chip, is often used.

Several manufacturers have decided that PCs will be used so often in

communications that a separate processor is desirable. Communications will become a "background task," something that goes on invisibly as you use the PC for word processing, or spreadsheet analysis. Microsoft shares this idea and has provided for communications as a "background task" in DOS 2.0.

To allow you full use of the PC processor while communications takes place, these manufacturers have dedicated another processor to handle communications. This processor (a Z-80, 6809, or 8088), has its own memory, its own routines in ROM, and its own serial port. It may also have its own modem on the same card. Whatever terminal emulation, communications, or protocol conversion must be done, is done by the communications processor, leaving the PC free for other tasks.

Co-processor products offer many advantages. Most of them allow both asynchronous and synchronous communications on the same card, as well as multiple terminal emulations. For example, Microlog's Babytelk includes an on-board 300 to 1200 baud modem, IBM 5251, 3270, 2780, 3780, and DEC VT-100 emulations, as well as an on-board serial port which can be used for printer despooling. If you need a wide variety of emulations, a bit more zip in your PC, or simply want to save those precious slots, consider one of the co-processor products.

Communications is not, however, the only use for co-processors. Operating systems or entire computers can be emulated on a co-processor card in your PC. The Microlog Baby Blue card uses a Z-80 co-processor to run CP/M-80 programs, and Quedam's Quadlink recreates an Apple II inside the PC. There are even co-processors so new that there is very little software available for them yet—for example, Sritek's 16032 board for the IBM PC.

Why are so many vendors selling so many products to make the PC look like other terminals, run other operating systems, and imitate other computers? You guessed it—there are so many PCs out there, and their number is going to keep growing. A market like this is irresistible.

As a PC owner or user, you are in a unique situation; you don't have to worry whether your machine is compatible with anything else. If it isn't now, it will be next week! /PC

TAKE CONTROL OF THE MOST POWERFUL TAX PROGRAM IN THE FIELD

SoftTax is a complete tax analysis, simulation and preparation package for users of VisiCalc® software.

Designed for individuals, partnerships, trusts, or corporations, SoftTax allows you to prepare all appropriate forms and schedules for direct submission to the IRS—automatically.

SoftTax is comprehensive and economical. You can set up, modify, and finalize a model before SoftTax prepares the final returns. And the model itself can be simulated before you commit to permanent changes.

You can try this easy-to-learn, easy-to-use professional tax package with our special demonstration package available now for only \$25. SoftTax runs on IBM-PC & XT, Apple II®, IIe, & III.

Call 1-800-243-4358 (outside CT) for details.

SoftTax Design Trends Ltd. • P.O. Box G • Wilton, CT 06897 • 203-834-1560

VisiCalc is a registered trademark of VisiCorp. Apple II is a registered trademark of Apple Computer.



**FROM
\$199**

Protocol Converters and Emulators for the IBM PC.

Asynchronous Terminal Emulators (Software-Only Products)

Emu-Tek

FTG Data Systems (PC Innovations)

10801 Dale St.

P.O. Box 615

Stanton, CA 90680

(714) 995-3900

Price: \$395

Requires: PC-DOS, async board.

Description: Tektronix 4010, terminal emulation, ADM3, Retrographics emulation. Supports HP and Amdek plotters, Epson printers, Hercules, CSI, Amdek, communications, light pen support.

Express Data Exchange

Newport Group

44 West Memorial Blvd.

P.O. Box 386

Newport, RI 02840

(401) 846-5783

Price: \$125

Requires: 64K RAM, async, monochrome.

Description: File transfer between TRS Model III, II, 12, and 16, and IBM PC, transfer up to 1200 baud, communications to 19200 baud, unattended transfer, confidential transfer.

HP2621 Terminal Emulator

Tymlabs Corporation

211 East 7 St., Suite 618

Austin, TX 78701

(512) 478-8811

Price: \$50

Requires: PC-DOS, 64K RAM, monochrome.

Description: Recognizes HP control characters, uses ENQ/ACK protocol to communicate with HP 3000 computer. For character mode transfers only.

Intern

Office Software Automation

4305 El Dorado Dr.

Plano, TX 75075

(214) 867-5307

Price: \$200

Requires: 96K RAM, PC-DOS, monochrome.

Description: VT 52/100 and IBM 3101 emulation, file upload, download, 110 to 9600 baud.

PC 100

General Microsystems

7525 Mitchell Rd., Suite 101

Minneapolis, MN 55344

(612) 937-9194

Price: \$89; PC 100/DP desk and printer support, \$129.

Requires: IBM PC or lookalike with DOS or QNX, 64K RAM, one disk drive, 80 x 25 display, async adapter.

Description: VT 100/102/52 emulation.

PC-Link

Screenware Corporation

P.O. Box 3662

Nashua, NH 03061

(603) 888-4047

Price: \$60

Requires: 64K RAM, async card.

Description: VT 100 terminal emulation with ASCII file transfer.

PC-Plot-III

Microplot Systems

1897 Red Fern Dr.

Columbus, OH 43229

(614) 882-4786

Price: \$75

Requires: PC-DOS; 64K RAM, IBM, Plantronix, or Hercules graphics board.

Description: Tektronix 4010 emulation, communications, HP 7470A plotting. All 4010, including interactive cursor reporting. Uses 4027 color.

Personal Computer Data Interface

Applied Microsystems, Inc.

P.O. Box 832

Roswell, GA 30077

(404) 475-0832

Price: \$250

Requires: 256K RAM, Hayes Smartmodem, two disk drives or hard disk. Unlimited corporate license, \$30,000.

Description: ASCII/EBCDIC communications, 110 to 9600 baud, data retrieval, data import export, two-dimensional data editor, global editing and two dimensional scrolling, 1 or 2 charts per screen, least squares data projection, integrated data management communications graphics.

Preview

Tymlabs Corporation

211 E 7 St., Suite 618

Austin, TX 78701

(512) 478-0611

Price: \$3,500

Requires: 64K RAM, monochrome.

Description: Runs on HP 3000, allows programs using block mode VPlus/3000 to run on any character CRT including the PC emulator by same company.

SDI-3780

Software Dynamics, Inc. of Florida

P.O. Box 247

Dunedin, FL 34296

(813) 733-8784

Price: \$599

Requires: 64K RAM, monochrome, by-sync or AST adapter.

Description: All 3780 RJE workstation functions emulated, point-to-point and multi-point, compatible with IBM Bisync AST CC-232/332 and Micro Synergy MPCC board. File transfer between IBM PC and DEC Rainbow 100/CDI Dot.

EXPECT A LOT *from* VEDIT

The Professional's Editor for Program Development, Word Processing, Source Code Translations

Widely acclaimed as an editor, VEDIT has evolved to be much more. Only VEDIT offers the combination of a versatile full screen editor integrated with a powerful command language based on TECO. For the first time you'll be able to perform complex, yet useful, text manipulations that are virtually impossible with other editors or word processors.

VEDIT is completely customizable - it easily configures to your favorite keyboard layout. Use any function or cursor key you wish. Plus, our total commitment to hardware support ensures that VEDIT will be perfectly matched to your individual needs and to any microcomputer you are ever likely to own.

VEDIT cuts programming time in half - with multiple file handling, macro capability and special features for Pascal, PL/I, 'C', Cobol, Assembler and other languages. And it can help with source code translations (example ZILOG to/from INTEL translator macros are included). A complete line of translators will be available by the year's end.

Word processing is a snap with word wrap, paragraph and print functions. Command macros free you from tedious search/replace operations. Hundreds of search/replace on dozens of files can be performed by VEDIT without waiting or intervening.

Go ahead and expect a lot from VEDIT. Its performance and our support will satisfy your most exacting needs.

VEDIT is available for virtually every 8080, Z80 or 8086 microcomputer made. To order please specify your computer, operating system and disk format.

VEDIT - Disk and Manual
8080, Z80 or IBM PC \$150
CP/M-86 or MSDOS \$195
Manual only \$18

VEDIT'S FEATURES:

True Full Screen Editing	Text Move and Copy	Word Wrap, Format Paragraph
Horizontal Scrolling	10 Scratchpad Buffers	Simple Printing
Edit Files One Disk in Length	Load/Save Buffers on Disk	150 Page Indexed Manual
Automatic Disk Buffering	Powerful Command Macros	Startup Command File
Compact (Only 16K) and Fast	Directory Display	Menu Driven Installation
Etiquette of Line and Column	Full Additional (small)	Program CRT Function Keys
Set/Goto Text Markers	Files Simultaneously	Support Newest CRT terminals
'Undo' Key to Restore Line	Insert Another Disk File	Support Smart CRT functions
Automatic Indent/Unindent	Unlimited File Handling	Flexible Memory Mapped Support
Adjustable Tab Positions	Recovery from 'Full Disk'	Customizable Keyboard Layout
Repeat Function Key	Change Disks While Editing	

CP/M is a registered trademark of Digital Research Inc. MSDOS is a trademark of Microsoft. IBM is a trademark of International Business Machines.

Quotes from InfoWorld review Copyright 1983 by Popular Computing, Inc. a subsidiary of CW Communications, Inc., Framingham, MA. Reprinted from InfoWorld.

InfoWorld Software Report Card

VEDIT 1.36

	Poor	Fair	Good	Excellent
Performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Documentation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Ease of Use	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Error Handling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Quotes from InfoWorld review by Tim Danieliuk

'The performance of this product is nothing short of outstanding!'

'The ability to customize the editor is especially useful.'

'VEDIT is a 'virtual' text editor. The amount of memory in your computer does not limit the size of the file you can edit.'

'VEDIT acts just as its advertising and documentation claim, with no unexpected errors or other problems. If anything, the advertising claims for this product are understated.'

'This is a well-conceived product. The many Visual-mode control and escape sequences make editing text simple, and the Command-mode features greatly simplify file handling and memory management.'

CompuView PRODUCTS, INC.

1955 Pauline Blvd., Suite 200 Ann Arbor, Michigan 48103 (313) 996-1299

WANTED

"Buyers & We'll pay the shippin'

• CALL FREE (800) 654-4058 •

"Call For Reduced Prices At Various Quantities"

Verbatim

5 1/4" sin-side dbl-den.	2 45
5 1/4" dbl-side dbl-den.	3 50
5 1/4" sin-side quad	3 45
5 1/4" dbl-side quad	4 45
8" sin-side sin-den.	2 95
8" sin-side dbl-den.	3 40
8" dbl-side dbl-den.	3 95

Head Cleaning Kits... 9 40
Refills... 14 00

Prices per ea.
10 per box the

Dysan

5 1/4" sin-side dbl-den.	3 95
5 1/4" dbl-side dbl-den.	4 45
5 1/4" sin-side quad	4 45
5 1/4" dbl-side quad	4 95
8" sin-side sin-den.	3 45
8" sin-side dbl-den.	4 45
8" dbl-side dbl-den.	4 95

We Stock "Bulk-Packaged" Diskettes

3M Scotch

5 1/4" sin-side dbl-den.	2 35
5 1/4" dbl-side dbl-den.	3 25
8" sin-side sin-den.	2 45
8" sin-side dbl-den.	3 00
8" dbl-side dbl-den.	3 95

Disk Minder
• Smoked Plastic
• Holds 75 Disks
17 95 ea

Dealer Inquiries Welcomed



P.O. Box 1614
Berwyn, IL 60402

Diskette Connection



(Continental U.S. only. Add 3% on orders under 40%)

CIRCLE 179 ON READER SERVICE CARD



MICROSTAT®
Advanced Statistics Package

MICROSTAT® is an interactive, file-oriented statistics package that includes:

- Data Management Subsystem for file creation. Allows editing, sorting, ranking and transformation of data.
- Descriptive Statistics, Hypothesis Testing, Frequency Distributions and Histograms, ANOVA, Nonparametric tests.
- Correlation and Regression (including stepwise multiple regression), Time Series, Scatterplots.
- Crosstabs, Chi-square tests, Factorials, Permutations, Combinations, and eight Probability Distributions.

MICROSTAT® has been the most popular statistics package in the microcomputer market for the past three years and is now available for the IBM-PC.

Requires PC-DOS and 64K memory but can utilize more memory if available. Dual disk drives recommended.

The price is \$325 and the user's manual \$25. To order, call or write:



P.O. Box 68602
Indianapolis, IN 46268-0602
(317) 255-6476



MICROSTAT is a registered trademark of ECOSOFT, INC.

CIRCLE 220 ON READER SERVICE CARD

PROGRAMMERS

"C" the extras we offer
More than just a compiler... we address the total programming environment

C Compiler —

- Complete non-float implementation (float avail 3Q) per Kernighan and Ritchie.
- Small and medium models supported. Medium model allows greater than 64k of code and greater than 64k of data.
- Complete standard I/O package.

c-window™ — Source level debugger

- Fully interactive symbolic debugging.
- Full C expression evaluation during debugging.
- Statement and expression breakpoints.
- Automatic commands provide multiple variable display per single step or breakpoint.

Ask for a demonstration package — you'll immediately "C" the difference!

Available for Victor 9000, IBM PC, Zenith Z100, other MSDOS systems. Inquire about CP/M-86 version.

C Compiler \$195.00
c-window \$195.00
c-window demo package (w/manual and diskette) \$45.00

Prices subject to change without notice.
c-window in c-systems; IBM on IBM Corp.'s MS-DOS on Microsoft; TI Professional on TI; CP/M-86 on Digital Research.

c-systems

P.O. Box 3253 • (714) 637-5362
Fullerton, CA 92634

CIRCLE 160 ON READER SERVICE CARD

STOP IBM THEFT



In business and education nationwide, our Pro-Tech locking stands have repeatedly proven their effectiveness in stopping computer theft. We now offer the Pro-Tech PC for the IBM PC or PC-XT — total system security at an affordable price.

Pro-Tech Security.

- Proven rear locking system. Just slide in your PC or PC-XT, lock it and you're done.
- Multiple units can be ordered that are keyed the same.
- Supplied with a 2 1/2" cable for securing any type of monitor directly to your Pro-Tech.
- Includes all hardware for bolting down the entire stand.

Pro-Tech. Endorsed by schools and colleges nationwide.

Pro-Tech PC, Price \$155

For ordering or further information, please contact:



Gregory Place
(817) 823-8684

P.O. Box 2676
Taunton, MA 02780

CIRCLE 270 ON READER SERVICE CARD

FREE INFO ON IBM PC

on "Choosing Color Monitors" and on all the products and programs needed to make your PC do its ultimate best for you.

16 COLOR MONITORS

Sony Profeel Series
12" or 19" \$895, 25" \$1495
Princeton Gr. 12" \$795
NEC 1203 \$895
Panasonic 1350MG .. \$700

SONY PROFEEL CABLES

(plus connector if nec.)

12/19/25-4 \$109.95

(modification req.)

12" special

(No modif.) \$129.95

For NEC 1203 - \$39.95

IDS PRISM COLOR PRINTER

Install. pgm to use Wordstar on Prism..... \$34.95

ColorTRAX for Prism \$49.95

COLOR GRAPHICS

RatTRAX PLUS for Epson,

Okidata or IDS - \$34.95

QuickDRAW shape

program \$49.95

PC-TUTOR color instruc.

program \$29.95

TRANFILE program to

send programs or files

from Apple or TRS80

to PC - \$199.95.

(includes disks & cable)

FREE INFORMATIVE LITERATURE ON STATISTICS • ENGINEERING • LEGAL ACCOUNTING • INVESTMENTS

We want to be your source for all commercially available programs in every field, including color graphics, games, spread sheets and also color boards and plotter programs.

* WE HAVE CABLES FOR ALL PRINTERS *

JACK STRICK & ASSOCIATES

949 South Southlake Drive • Hollywood, FL 33019

Tel. (305) 925-7004

CIRCLE 433 ON READER SERVICE CARD

WATSOFTPRODUCTS INC

A subsidiary of the University of Waterloo

Announces

a full screen editor and a family of language interpreters for the IBM Personal Computer

**APL
BASIC
COBOL
EDITOR
FORTRAN
PASCAL**

For further information contact:

WATSOFT Products Inc
158 University Ave
Waterloo, Ontario
N2L 3E9

(519) 866-3700
Telex No. 06-955458

CIRCLE 474 ON READER SERVICE CARD



PC Designs

corona

IBM

COMPAQ

COLUMBIA

DATA PRODUCTS, INC

(714) 547-7151

SYSTEMS AVAILABLE - CALL FOR PRICES

MEMORY & FUNCTION BOARDS

AST Research Inc.
Std Pack & Function 64K, s.p.c/c
Mega Plus II 64K, s.p.c/c
Combit Plus 64K, s.p.c/c
I/O Plus II, s.p.c/c
All A S.T. products include superspool and superdrive

8TB SYSTEMS INC.

RIO Plus 64K, s.p.c/c
Super RIO 64K, 2s.p.c/c
Super I/O, s.p.c/c
All 8TB products include
PC Accelerator Software

CONTROL CARDS

Maryland Electronics Inc.
5 1/4 in. control card
8 in. control card
Standard series available

Tell me systems Software

J-Format 2.0

Jet Drive

Wind Drive

U Utilities

Prepaid discount

Accept: C.O.D., M.O., Cashiers, MasterCard, VisaCard

Group and Corporate discounts available

COLORGRAPHICS

Amdek MLI w/par
Planitronics col/graph w/par
USI Multidisplay w/par
SIB col/graph w/par
Hercules Graphics Card

MONITORS

Amdek full line of monitors avail
PDS color monitor discount prices
USI color monitor discount prices

PRINTERS

Epson
F x 80
FX 100
RX 80
Sensitron
10X
15X

Brother

Also Available

Dixons

Also Available

DISK DRIVES

\$34 Shugart Slimline

\$34 Tandem 50-2 Slimline

\$34 Qume 140-2 48TPI, 320K

\$45 Qume 142-2s HT 48TPI, 320K

CALL

\$385

\$350

\$348

\$360

CALL

CALL

CALL

\$849

\$848

\$385

\$278

\$488

CALL

CALL

CALL

\$206

\$234

\$216

DISK MECHANIC

The ULTIMATE Backup, Analyze & Repair Utility
The Disk Toolkit NO IBM PC Should be Without

Protects Your Software Investment

BACKUP TOOLS:

- Can Backup Most Every Diskette
- SUCCEEDS where others fail
- Works Manually or Automatically
- Create "Protected" Diskettes
- Modify (ZAP) Sector Data
- Search Sectors For Data

FILE TOOLS:

- Show Disk & File Allocation
- Display & Alter File Data
- Repair Damaged Disks
- Recover Erased Files
- Alter "Hidden" Status
- Search Files For Data

SECTOR TOOLS:

- Examine/Print Sector Data
- Modify (ZAP) Sector Data
- Compare, Copy & Zero Sectors
- Search Sectors For Data

HACKER TOOLS:

- Supports All FDC R/W Commands
- Parameters

DISK MECHANIC works with all standard IBM PC disk formats including "protected" diskettes with mixed track and sector sizes, blank and high track formatting, CRC errors, and single or double sided drives. DISK MECHANIC requires an IBM PC with 128K of memory or COMPAQ with 128K of memory. DOS 1.10, and 2 floppy disk drives. DISK MECHANIC includes a detailed 48 page instruction manual. To Order DISK MECHANIC send check or money order for \$70 plus \$3 for shipping (Mass. res. add sales tax.) to: MLI MICROSYSTEMS, Box 825, Framingham, Mass. 01701 or Call (617) 826-2055 for MasterCard or VISA orders. Dealer/Distributor inquiries welcome. ©1983 MLI MICROSYSTEMS.

MLI MICROSYSTEMS

CIRCLE 340 ON READER SERVICE CARD

2107 North Broadway, Suite 208, Santa Ana, Calif. 92706

CIRCLE 479 ON READER SERVICE CARD

TE-100: FT

Parsoft

2740 Ski La.

Madison, WI 53713

(608) 233-1000

Price: \$150**Requires:** 96K RAM, PC-DOS, esync, I/O, two disk drives.**Description:** DEC VT 100, VT 101, VT 102, VT 52 terminal emulation with file transfer. Speed up to 9600 baud.**TE-400 FT**

Persoft

2748 Ski La.

Madison, WI 53713

(608) 233-1000

Price: \$125**Requires:** 96 K RAM, PC-DOS, async, I/O, two disk drives.**Description:** Data General D100, D200, D400 terminal emulation with file transfer. Speed up to 9600 baud.**V/Term**

Techland Systems, Inc.

25 Waterside Plaza

New York, NY 10010

(212) 684-7788

Price: \$125**Requires:** PC-DOS, 64K RAM, monochrome.**Description:** DEC VT 100 and VT 52 emulator.**VDTE 2**

Inner Loop Software

P.O. Box 45857-A

Los Angeles, CA 90045

(213) 645-5162

Price: \$200**Requires:** PC-DOS, 64K RAM, monochrome, async card.**Description:** HP 2624B, 2648A, DEC 52 emulation, designed for communication with HP 3000, block mode transfer with HP 3000, 110 to 19200 baud, HP 2648 vacor plot subset. File transfer.**Synchronous Terminal/Protocol Emulators**

(Most of these products include hardware boards for synchronous communications.)

AST Communications Card

AST Research, Inc.

2372 Morsa Ave.

Irvine, CA 92714

(714) 548-1333

Price: \$295**Requires:** PC-DOS, 64K RAM, monochrome.**Description:** Bisync, SDLC, HDLC, ASYNC. Two RS232 ports.

Advanced Communications Board

Frontier Technologies Corp.

P.O. Box 11238

Milwaukee, WI 53211

(414) 964-8689

Price: \$275**Requires:** 64K RAM.**Description:** Dual channel, Bisync or Async, HDLC, SDLC, X.25 support. Real-time clock and parallel port options. Software gives X.25 level III, HDLC level II support. Options are \$40 each.

BARR/HASP

BARR Systems, Inc.

2500 Blue Ridge Rd. Suite 315

Raleigh, NC 27607

(800) BARR-SYS

Price: \$750**Requires:** 64K RAM, 80 column card, monochrome.**Description:** Bisync communication with MVS/JES2, JES3, VM/RSCS, VSI/RES, ASP, Data General Hamlet, all HASP multi-leaving protocols. Multiple print support 1200 to 19200 baud.

Blue Lynx 3276

Techland Systems, Inc.

25 Waterside Plaza

New York, NY 10010

(212) 684-7788

Price: \$690**Requires:** PC-DOS, 96K RAM.**Description:** SNA/SDLC dial-up, lease line, multidrop, NRZ/NRZI support. Upload and download printer support independent of screen and keyboard, includes hardware and software.

Blue Lynx 3276/5

Techland Systems, Inc.

25 Waterside Plaza

New York, NY 10010

(212) 684-7788

Price: \$698**Requires:** PC-DOS, 96K RAM.**Description:** Bisync dial-up, lease line multidrop. Upload and download printer support, independent of screen and keyboard, includes hardware and software.

Blue Lynx 5251

Techland Systems, Inc.

25 Waterside Plaza

New York, NY 10010

(212) 684-7788

Price: \$690**Requires:** PC-DOS, 96K RAM.**Description:** IBM Model 12 remote terminal emulation for S/34/36/38 dial-up, lease line, multidrop, includes hardware and software.

Blue Lynx ETU 38

Techland Systems, Inc.

25 Waterside Plaza

New York, NY 10010

(212) 684-7788

Price: \$800**Requires:** Blue Lynx 5251.**Description:** Host utility, upload and download of files for S/38.

Blue Lynx ETU 34

Techland Systems, Inc.

25 Waterside Plaza

New York, NY 10010

(212) 684-7788

Price: \$400**Requires:** Blue Lynx 5251.**Description:** Host utility, upload and download of files for S/34.

Blue Lynx ETU 38

Techland Systems, Inc.

25 Waterside Plaza

New York, NY 10010

(212) 684-7788

Price: \$500**Requires:** Blue Lynx 5251**Description:** Host utility, upload and download of files for S/38.

SOFTWARE & HARDWARE FOR THE IBM P.C.

SOFTWARE

Acorn Software
LOST COLONY 25.00

Advanced Operating Systems
THE PROGRAMMER 395.00

Alphe Software
DATABASE MANAGER 165.00
MAILING LIST 95.00
QUESTION 45.00
TYPE FACES 95.00
APPLE-IBM CONNECTION 120.00

Ashton-Tate
dBASE II 499.00

Automated Simulations
TEMPLE OF APSHAI 32.00
UPPER REACHES OF
APSHAI 17.00
JABBERTALKY 25.00
CURSE OF RA 17.00
OIL BARONS 65.00

Avelon Hill Gems Co.
GALAXY 21.00
8-1 BOMBER 18.00
MIDWAY 18.00
STOCKS & BONDS 21.00
VOYAGER 21.00
DRAW POKER 18.00
FOOTBALL 18.00
ANDROMEDA CONQUEST 20.00

Best Programs
PERSONAL FINANCE 82.00

Broderbund Software
APPLE PANIC 25.00

Cavelier Computer
BLACK JACK 32.00

Charles Mann
TEACHER P.C. TBA

Compu-View
CP/M 86 295.00

Condor Computer
CONDOR DATA BASE 259.00

Context Management Systems
CONTEXT MBA 595.00

Continental Software
HOME ACCOUNTANT 125.00
1ST CLASS MAIL 110.00

Dete Most
WRITE-ON 105.00
PIG PEN 25.00
SPACE STRIKE 25.00

Denver Software
EASY 599.00

Digital Marketing
CONCURRENT CP/M TBA

Eagle Software Publishing
MONEY DECISIONS 169.00

Friendly Software
FRIENDLYWARE 42.00

Howard Software
REAL ESTATE ANALYZER 215.00

Intocom
ZORK I 32.00
ZORK II 32.00
ZORK III 32.00
DEADLINE 40.00
STARCROSS 32.00

Innovative Software
TIM III 395.00

ISM
MATHMAGIC 75.00
GRAPHMAGIC 75.00
COMBO PACKAGE 135.00

IUS
EASY WRITER 159.00
EASY WRITER II 275.00
EASY PLANNER 195.00
EASY SPELLER 135.00
EASY FILTER 299.00

On-Line Systems
ULYSSES 29.00
FRODOG 29.00
GOLF 20.00

Persyst
INSTA-DRIVE 44.00
WAITLESS PRINTING 44.00

Professional Software
WORDPLUS TBA

Proximity Software
WORD CHALLENGE 32.00

Select
SELECT W.P. 449.00

Sentiant Software
CYBORG 29.00

Sirius Software
CALL TO ARMS 25.00

Sorctm
SUPERCALC 238.00
SUPERWRITER 319.00
SPELL GUARD 159.00

Spinnaker Software
SNOOPER TROOPS 1 38.00
SNOOPER TROOPS 2 38.00
STORY MACHINE 28.00
FACE MAKER 28.00

Strategic Simulations
WARP FACTOR 32.00

Synargistic Software
DATA REPORTER 215.00

Varse Computing
HARDCOPY SYSTEM 21.00

Visicorp
VISICALC 189.00
VISI-FILE 229.00
DESK TOP PLAN 229.00
VISITRENO/PLOT 229.00
VISIDEX 189.00
VISISCHEDULE 229.00
BUSINESS FORECASTING 79.00

HARDWARE

Amdak
COLOR I MONITOR 349.00
COLOR II MONITOR 725.00
300C MONITOR 159.00
300A MONITOR 175.00
310A MONITOR 185.00

Brother
PRINTER, 16CPS 995.00
PRINTER, 18CPS, SERIAL 1095.00
TRACTOR FEED FOR HR-1 155.00

D.C. Hayes
SMART MODEM 300 BAUD 249.00
SMART MODEM 300-1200 595.00
BAUD 175.00
CHRONOGRAPH CLOCK 219.00

Epson
MX80 PRINTER 479.00
MX80FT PRINTER 499.00

MX100 PRINTER 699.00
PRINTER CABLE 35.00

Frederick Electronics
COLOR PLUS+ 849.00

Hard Disks
CORONA 35.00
CORVUS 35.00
OAVONG 35.00
MAEZON 35.00
QUECES 35.00
TECHMAR 35.00
VR DATA 35.00

T.G. Products
JOYSTICK 59.95

Kraft
JOYSTICK 49.95

Microsoft
64K RAM EXPANDABLE TO 256K 399.00

Memory Technologies
VERSA RAM 269.00
EXPANDABLE TO 512K

M&R Associates
SUPER MD0 TBA

Novations Inc.
CAT MODEM 169.00
D-CAT MODEM 179.00
AUTO-CAT 225.00
APPLE-CAT 295.00

Oskide
82A PRINTER 499.00
83A PRINTER 725.00
84P PRINTER 1079.00



FREDERICK COMPUTER PRODUCTS, INC.

Micro-computer systems and peripherals

5726 INDUSTRY LANE • FREDERICK, MARYLAND 21701

(301)694-8884

TERMS: Shipping 1%
Minimum Shipping Charge \$3.00
Maryland Residents Add 5% State Sales Tax
Visa & Mastercard Orders Add 2%
Maximum Credit Card Order
Prices Subject To Change

NOTE: Frederick Computer Products has a complete line of software, hardware, media and supply items in stock. Call for further information & pricing.
Frederick Computer Products has IBM sales and service.

CLEO-3270

Phone 1, Inc.
461 N. Mulford Rd.
Rockford, IL 61107
(815) 397-8110

Price: \$500

Requires: 64K RAM, monochrome.

Description: IBM 3271-12 cluster emulation. Bisynd 3276-2, protocol to 9600 baud, SDLC 3271-12, 3275-12, up to 8 line cluster, also available for CP/M, MP/M, MS-DOS, UNIX, Xenix.

CLEO-3780

Phone 1, Inc.
461 N. Mulford Rd.
Rockford, IL 61107
(815) 397-8110

Price: \$500

Requires: 64K RAM, monochrome.

Description: Point-to-point and multi-point communications, RBT emulator for 3780. Transparent mode supported, also available for CP/M, MP/M, MS-DOS, UNIX, Xenix.

EMU-LINK, COAX-LINK

Micro Link Corporation
P.O. Box 113
1850 Wayzata Blvd.
Long Lake, MN 55358
(812) 476-1300

Price: COAX-LINK, \$1,095; EMU-LINK, \$695

Requires: 64K RAM, monochrome.

Description: Bisynd interface adapter and 3276/3278-2, BSC or SNA/SDLC operation, includes hardware and software.

FTP

On-Line Business Systems, Inc.
115 Sansome St.
San Francisco, CA 94104
(415) 391-9555

Price: \$4,000 for up to 10 micro copies.

Requires: 64K RAM, monochrome, CP/M or PC-DOS.

Description: File transfer from mainframe TSO or VM/CMS to or from POCRC error checking and retransmission, async terminal emulation for TSO and VM/CMS. Product includes command processors for TSO and VM/CMS.

IBM 3270 PC Attachment Option

IBM Corporation
Systems Products Division
P.O. Box 1328-C
Boca Raton, FL 33432
(800) 447-4700

Price: \$1,700

Requires: 64K RAM, monochrome.

Description: Connects PC to IBM 3278 display station; one keyboard and monitor can access both the PC and the 3278; the 3278 can both access the mainframe computer and control the PC.

IBM Bisynchronous Communications

IBM Corporation
Systems Products Division
P.O. Box 1328-C
Boca Raton, FL 33432
(800) 447-4700

Price: Adapter card, \$300; 3270 emulation software, \$700.

Requires: PC, 64K RAM, monochrome.

Description: Bisynchronous communications with IBM mainframes and minis.

PC 3270

AST Research, Inc.
2372 Morse Ave.
Irvine, CA 92714
(714) 548-1333

Price: \$895

Requires: PC-DOS, 128K RAM, monochrome display.

Description: 3274 control unit, 3278/3279 station, 3287 printer, 3770 RJE terminal, SNA/SDLC support, includes communications board and software. Optimal printer, one expansion slot SNA 3270X adapter. Synchronous mode for distances of more than 50 feet.

AST 3780

AST Research, Inc.
2372 Morse Ave.
Irvine, CA 92714
(714) 548-1333

Price: \$945

Requires: PC-DOS, 128K RAM, monochrome display.

Description: Bisynd support bidirectional file transfer with IBM 370s, system 340, 4300s, and DEC and WANG supported minis. Dynamic receive device selection, interactive or unattended operation. Handles ASCII to EBCDIC translation will do PC-to-PC translations.

AST 5251

AST Research, Inc.
2372 Morse Ave.
Irvine, CA 92714
(714) 548-1333

Price: \$895

Requires: PC-DOS, 128K RAM, monochrome display.

Description: A 5251 Model 12 emulation package for communicating with IBM S/34, S/36, S/38. A parallel printer attached to the PC will emulate a 5258 printer. Packages for corrections up to synchronous modems with speeds from 1200 to 9600 baud optional B, directional to the transfer software.

PC Express

Intelligent Technologies International Corporation
151 University Ave.
Palo Alto, CA 94301
(415) 328-2411

Price: PC-to-PC Communication, \$895; PC-Express, \$1,295.

Requires: PC-DOS, 256K, monochrome or color, two disk drives or hard disk, expansion slot in PC.

Description: Async, synch, and voice SNA/SDLC, DEC VT-100/52 emulation. Telephone management system with phone directory, full-screen text editor, call history file, auto dial/answer, a electronic mail and chapter terminal access, 300-baud modem on board.

PM-300

AVCOM, Inc.
P.O. Box 29153
Columbus, OH 43229
(614) 882-8176

Price: \$189.95

Requires: PC-DOS, 64K RAM, monochrome, or color graphics card.

Description: 300-baud modem with CompuServe "B" protocol support, videotex software enters data receive into disk file or displays, file, upload/download.

INFO SOURCE

FOR THE IBM PC

A Monthly Update Publication

INFO SOURCE

Gathers information for you on:

Hardware • Books • Software • Magazines

FOR THE IBM PC

Up to date • Single source • Selective

INFO SOURCE

Provides you with:

Product descriptions • Comparative product charts
System requirements • XT compatibility information
Vendors' addresses & telephone numbers • Complete index

FOR THE IBM PC

In the fast changing world of the IBM PC, with new products introduced daily, you need *InfoSource*. You can quickly and conveniently read the description of a new mouse, examine in a chart the differences between key database programs or learn about a new book on the C language. All this information, and more, is available in a single binder. Subscribe today and you will receive the complete, current issue. And each succeeding month you will receive timely updates by first class mail.

InfoSource for the IBM PC QUERY

P.O. Box 417 • Bogota, NJ 07603 • (201) 836-7389

Please send me:

Annual subscription
(includes current issue,
binder & 11 updates):

\$69.00

Complete current issue
(includes binder):

\$21.95

More information: ☐

(Same rates apply for Canada & Mexico. Higher rates for other countries.)

Name: _____

Co.: _____

Street: _____

City/St./Zip: _____

Dealer inquiries invited.

InfoSource is an independent publication which neither accepts ads nor sells items which it describes. IBM and IBM PC are trademarks of International Business Machines Corporation. Please allow 4 to 6 weeks for delivery.

HP TERMINAL EMULATOR FOR YOUR IBM PC

Now your IBM Personal Computer can be used as a Hewlett-Packard 26XX family terminal. Instead of just a terminal, you'll have a general purpose microcomputer. **VDTE 2** is the powerful, easy to use terminal emulation program that provides the features you need!

HP2624B, HP2648A and DEC VT52 modes

HP2624 block/format mode for most HP3000 software

Eight displayed softkeys (program controlled)

HP2648 vector graphics plotting subset

Supports up to two serial ports

Seven page scrolling memory (per port)

Cursor control arrow and scrolling keys

Print screen, all pages, cursor down, print-through

Ten speeds include 300, 1200, and 9600 baud

General purpose file transfer between PC and host

Price: \$200 (California residents add 6% tax)



Inner Loop Software

P.O. Box 45857-A
Los Angeles, CA 90045
(213) 645-5162

Send for our free brochure

CIRCLE 277 ON READER SERVICE CARD

WE'RE THE BEST!

BEST SELECTION!
BEST PRICES!

PERCOM DATA™ STORAGE SYSTEMS FOR IBM-PC™

PC POWER PACK™ For IBM-PC™

• A joint venture of Digital Research Inc. and Percom Data Corp. • Percom Data
• Hard Disk Drive - 192K RAM Board and Controller • Digital Research Concurrent
• CP/M-86™ Operating System **Three Part Package — ONE GREAT PRICE!**

5 MB \$1295.00 10 MB \$1795.00

Percom Data™ Floppy Drives For IBM-PC™

• **Internal:** Single Head 160K — \$279.95
Dual Head 320K — \$354.95
• **External:** Single Head 160K — \$415.95
Dual Head 320K — \$519.95

DYNAX DIX15™ Daisy Wheel Printer

— Now Only \$559.00

STAR GEMINI™

MODEL 10X & 15 — Call For Low Price!

MEMORY EXPANSION CARDS FOR IBM-PC™

• **STB Super Rio™** 65K IBM RAM-10 Multifunction Card With
Two RS232 Serial & One Parallel Port, Game Port &
Clock/Calendar — \$544.95
• **STB Super Rio™** 192K IBM RAM-10 Multifunction Card — \$759.95
• **STB Super Rio™** 256K IBM RAM-10 Multifunction Card — \$889.95

MEDIA FOR LESS

• **BENTON™** complete with hub rings & one year limited warranty.
• Single sided/Single density 5 1/4" — \$22.00 bx of 10
• Single sided/Double density 5 1/4" — \$24.00 bx of 10
• Double sided/Double density 5 1/4" — \$33.00 bx of 10

• **BUY DISKETTES IN BULK AND SAVE FROM ONLY \$210.00** case of 100

Order By Phone Or Mail.

1-800-527-3475

Dept. H-7/401 N. Central Expwy., Richardson, Texas 75080

ACCESS UNLIMITED
MICRO SHOPPING CENTER

CIRCLE 135 ON READER SERVICE CARD

CIRCLE 524 ON READER SERVICE CARD

PC MAGAZINE 364 NOVEMBER 1983

BRT CHEAP!

**QUADRAM • ZENITH •
IBM • AST • HAYES •
EAGLE • COLUMBIA DATA •**

Super Printer & Monitor Values

★ **GIVE US YOUR BEST PRICE** ★
Let's face it; you're shopping mail order to obtain down-to-earth pricing on quality equipment. Our prices and support have always been excellent, but now — because of huge purchasing commitments on our part — you can save even more. We don't advertise prices because *The more we buy, the more you save.*

COLUMBIA DATA PRODUCTS

PORTABLE & STAND ALONE • IBM COMPATIBLE
128K, 8 IBM expansion slots, dual floppy or hard disk systems, graphics, etc. **CALL
FREE \$3,000.00 WORTH OF SOFTWARE**

PROWRITER/STARWRITER

GEMINI • IDS • OKIDATA • NEC

★ **LOWEST PRINTER PRICES** ★

TOSHIBA HALFHEIGHT DRIVES \$249

HUNDREDS OF PRODUCTS INCLUDING:

IBM BOARDS

PLATINUMS • COLOR PLUS

SCION

HERCULES

MAI

QUADRAM

CALIFORNIA COMPUTER

AST

STB

VISTA

BABY BLUE

HARD DISK DRIVES

TALL GRAPHICS

DAVON

CORVUS

MONITORS

PRINCETON GRAPHICS

AMDEK

QUADCHROME

REC

MODEMS

HAYES 300

HAYES 1200

HAYES 1200B

SOFTWARE

ALL KINOS*

SYSTEMS

ALL KINOS*

* We take MasterCard and VISA (include card number and expiration date). Maryland residents add 5% sales tax. Include \$2.00 for postage on orders less than \$50.00. For C.O.D. orders, freight and hardware shipments are extra. Prices are subject to change. Some prices reflect 2% cash discount.

* Apple is a Registered Trademark of Apple Computer, Inc.
* AT&T is a Registered Trademark of AT&T, Inc.
* IBM is a Registered Trademark of International Business Machines Corporation.
* Minolta is a Registered Trademark of Minolta Design, Inc.
* Tandon is a Registered Trademark of Tandon Corporation.
* Commodore is a Registered Trademark of Commodore Business Machines.

PROgrams

15924 SHADY GROVE RD
GAITHERSBURG, MD 20877

plus

BALTIMORE • ANNAP.
(301) 532-2506

MD., D.C., NORTH VA.
(301) 840-5979

OUTSIDE MARYLAND
1-800-368-2805

CIRCLE 517 ON READER SERVICE CARD

APPLE IIe IBM P/C-XT NEW PORTABLE



ON SALE
\$1149.00

CALL NOW
FOR SALE PRICE

COLUMBIA VP
\$2359.00

COMPUTERS

IBM P/C 54K with Dual 320K Drives,
Disk Controller, and Mono. Color.
Graphics Card ON SALE 2499
Compaq 54K 549
Hyperion 4195
Eagle PC-XL 3395
Columbia MLC Package

128K, Dual 320K Drives, Keyboard,
Mono/Color Graphics Cards with
Tons of Software and Features
Package Price 32149
Compaq Portable w/ 1 drive 1995
Compaq Desktop w/ 2 drives 2495
Pied Piper by STM 1049
NANO by BRS. 999
Kyrion II, 4 on 1 999
DEC Rainbow 100 999
Zorba 1149
Apple IIe 1149

IBM AND COMP. ACCESS.

Multicard 256K by Viste 449
P.C. Part Hard Disk 299
PC Modern Plus 299
System Card by MS 279
QUADLINK by Quadram 529
Quadboard II. 279
Koski Pad 349
Multidisplay by USI 349
Mica? Call Us
Monia Carlo Card 349
ASI + USI + TEGMAR. IN STOCK

IBM SOFTWARE

Visual Graphics 359
Lotus 1-2-3 CALL
Wordstar 229
Crossark 109
JUKI 6150 499

MONITORS

Princeton Graphics HX 12. 499
Hi-RES Amber 129
Compaq Color 289
RGB BEST BUY

PRINTERS

Gemini 10x 299
NEC 3550 1899
Silver Reed 550 499
Pechewe 499

BUY DIRECT AND SAVE

For Complete Selection and
Lowest Prices — Free Catalog

All prices and products subject to
change and availability.

TO ORDER
(619) 291-1442

COMPUTERS and more

2420 University Ave., Suite 3,
San Diego, CA 92104

CIRCLE 130 ON READER SERVICE CARD

THE ULTIMATE COMPUTER COVER



In Ultra suede®.

A luxurious and functional
cover for your IBM PC.
Protect your investment with machine washable, soil-
resistant Ultra suede fabric. Add style and elegance to
your home or office. Three designer colors: Camel,
Smoke Grey and Ebony, \$99.
Embroidered monogram available (three initials), \$6.
Please allow 6-8 weeks for delivery.

Call Toll Free 800-437-4400 with Visa or Master-
Card or Order by Mail: **Designs In Fabric**, 32 Marwood
Road South, Port Washington, New York 11050.

Color: ☐ Monogram

New York residents please add area sales tax and \$3 per cover for shipping
and handling.

☐ Visa ☐ MasterCard ☐ Check Exp. Date _____

Name _____

Address _____

City _____ State _____ Zip _____

Ultra suede® is a registered trademark of Springs Industries, Inc.

CIRCLE 194 ON READER SERVICE CARD

Oh, My
Aching Back!



- Our ergonomic COMPUTER CHAIRS prevent sit strain. No more aching back, tired thighs or throbbing neck, while working at your IBM PC
- Finger-tip lever pneumatically lets you adjust seat to exact height needed. (16"-22")
- Full-support backrest floats with pneumatic ease. gently exerts proper support where you need it most. Light-touch lever lifts backrest forward & backward while you sit
- The backrest has a special convex shape in the lumbar (lower spine) area for proper spine support. Backrest can easily be raised or lowered.
- The open armrests allow you to pull close to your workstation. Armrests are padded for additional comfort.
- Four year warranty. This chair is UPSable and can easily be returned to our Chicago Service Center if repairs are needed.
- Advanced ergonomic research helps this chair outperform all others. Made in Western Germany.
- Satisfaction guaranteed: If not completely satisfied within 15 days, return the chair for a full refund.
- **IBM PC USER SPECIAL PRICE \$325.00** (regular price \$405.00 save 20%)



**ORDER NOW!
AVAILABLE IMMEDIATELY**

- Send Name & Shipping Address
- Daytime Phone Number
- Check or Credit Card # and Exp. Date
- Specify Color: Charcoal, Dr. Brown, Beige, Wine, Navy
- Call Collect 312-743-5200 Days 9-5
- Illinois Residents add 7% Sales Tax
- Add \$12.00 for Shipping and Handling
- MC/Visa/American Express

NORDHAUS ERGONOMIC CHAIRS

7122 N. Clark St. Dept. 103
Chicago, IL 60626
312-743-5200

Multifunction Emulation/Communications Networking Products

(These products have local intelligence and are capable, for the most part, of co-processing.)

ABM Intelligent Communications Processor
ABM Computer Systems
23362 Peralta Dr.
Laguna Hills, CA 92653
(714) 859-6531

Price: \$2685

Requires: 64K RAM, monochrome, or color display adapter.

Description: 3270 emulation, includes card, capable of supporting one to thirteen PCs per cluster, 3276 display and control unit, or 3276/3274 cluster controller for 3270 BSC, SNA/SDLC, 3780/2780 BSC. On board Z80B, co-processing, one parallel, four serial programmable ports.

Bebytalk Microlog
222 Route 59
Suffern, NY 10901
(914) 368-0353
Price: \$895

Requires: PC-DOS, 64K, monochrome.
Description: Termino emulator/smart modem/protocol converter 3270 bisync, SNA, 2770, 2780, 3770, 3780 BATCH/BISYNC, esynch terminals VT 100, VT 52, IBM 3101, 5251, on board 300 to 1200 baud modem, serial parallel port.

DCP-88 Distributed Communications Processor
Personal Systems Technology, Inc.
Suite A
15801 Rockfield Blvd.
Irvine, CA 92714
(714) 859-8871

Price: base configuration, \$695; maximum configuration, \$945.

Requires: PC-DOS, 64K RAM monochrome.

Description: DCP-88 is an 8088-based front-end communications processor module. That others synchronous/esynchronous communications and supports esynch, bisync, DH1C and SDLC protocols, and line printers to 600 lines per minute.

ELAN
Tecmar, Inc.
6225 Cochran Rd.
Cleveland, OH 44139
(216) 349-0600
Price: Secretary, \$1695; manager, \$1995, executive \$2,995.
Requires: Various boards from Tecmar.
Description: Ethernet link, 300 to 1200 baud modem, call forwarding and message support, voice mail, voice recognition.

Irmaline
Technical Analysis
128 W. Wieuca Rd. N.E.
Atlanta, GA 30042
(404) 252-1045
Price: \$1,395

Requires: two dial service modems, type A adapters on controller.

Description: Protocol converter installed via co-ax connection at 3274 local or remote, 3276, or integral terminal suite. Provides asynch data in IBM 3101 or DEC VT 100 format. 3278 emulation, networking through phone-line sharing, up to 32 Irmalines per site.

Linkup
Information Technologies, Inc.
7850 East Evans Rd.
Scottsdale, Arizona 85260
(602) 998-1033
Price: \$795
Requires: PC-DOS, 64K monochrome.
Description: Emulator/protocol converter DEC VT 52/100, IBM 3101 2780/3780.

**YOU
CAN MAKE
A FORTUNE
IN MICROS!**

THE MICRO COMPUTER BUSINESS WILL GROW FROM \$10 TO \$100 BILLION IN THE NEXT EIGHT YEARS! ARE YOU READY TO CASH IN?

The micro computer business is predicted to grow from its present \$10 billion to \$100 billion before 1990! Imagine the possibilities this opens for you! No matter where you live, if you're starting up or presently in business, no other industry offers you more opportunities!

Now, finally, all the inside information you need to secure a prosperous future in this dynamic industry is available in one place - **THE COMPUTER ENTREPRENEUR MANUAL** - An immense information source, compiled by our inquisitive research team, aided by a panel of experts and business people from all areas of the computer industry!

We present the inside story of more than 100 lucrative computer businesses you can enter, where you'll find the real opportunities for the eighties: from one man operations like Programming Author, Word Processing Center or Consulting, to Systems House, Service Bureau, Computer Store and Many, all at little or no investment! All the invaluable facts and figures you need to start, Capital needs, Profit estimates and Margins, How to Sell and Market, How to hire technical or business experience need not stand in your way. Source of Suppliers, etc. Details that could take years to find out on your own!

We'll show you inside tricks, like how to never again pay retail for computer products and consumer electronics, even for one item - right now, while you're starting your business! How to get free merchandise and trade show invitations, etc. This alone will more than pay for the manual! You'll read actual case histories of other computer entrepreneurs, so you can learn from their mistakes, and profit from their success stories! Where you'll be one year from now depends on your actions today! Let us show you how to take the first crucial steps!

Order now and take advantage of our limited introduction special, **THE COMPUTER ENTREPRENEUR MANUAL**, and a six month subscription to **THE COMPUTER ENTREPRENEUR REPORT/NEWSLETTER** (so you're always up-to-date with the industry), both for only \$29.95! You must be convinced on how easy you can strike it rich in the micro computer business - or you may return the manual for a full refund within thirty days! **USE OUR TOLL FREE NUMBER TO ORDER!**

EVERYTHING YOU NEED TO KNOW TO SUCCEED IN THE COMPUTER BUSINESS IS ALL IN THIS MANUAL!

THE COMPUTER ENTREPRENEUR MANUAL has the answers to all your questions about selecting, starting and successfully running a computer business! There has never been such a comprehensive collection of know-how and information about this business in one place! All the facts you need to plan and achieve your goals in easy-to-follow, step-by-step instructions!

These are some of the 100-plus businesses covered in **PART ONE** of the manual, with the facts on how to start and run, Start-up Cost (Even how to operate on a shoestring!), What profits to expect, Wholesale prices, Mark-up, Suppliers, future outlook, case histories for each, etc.: Systems House, Software Author (who to sell to and who to avoid), Service Bureau, Self-Publisher (How to find programs that sell), Word Processing Service, Consulting and Consultant Broker (use your skills or those of others, make \$150 - \$1000 a day!), The Incredible Games Business, Computer Store (Franchises, Pro and Con), or a low inventory store in your home!), OEM, Hardware Mfg., Data base and Teletext Service (big prospect!), Used Computers, Repairs, Rent-A-Computer, Promote Fests and Trade Shows, Turnkey Systems,

Bartering, Mail Order, Compile and rent mailing lists, Specialized Data Headhunting and Temp Help Service, Tech Writer Shop, Custom Engineering, The highly profitable Seminars and Training Business, and many more!

Many new ideas and ground floor opportunities! Interviews and success stories on companies of all sizes! Privy info on the profits made! How some computer store operators net \$100 - \$250,000! Little known outlets that make their owners millionaires, one of these low-key companies, making simple boards went from all to \$250,000,000 and 100 employees in four years! Programmers that make \$300,000. Thousands of micro millionaires in the making, etc!

Whatever your goal is - Silicon Valley Tycoon, or just a business at home - we guarantee you'll find a business to suit you - or your money back! **PART TWO** of the manual is loaded with the know-how and "streetfighting" savvy you need, both as a novice or business veteran, to get started, to stay and to prosper in this micro computer business! A goldmine of information in clear and easy-to-use instructions. How to prepare your Business Plan, Outside Financing, The mistakes you must avoid, How to hire and manage employees, Incorporation (when, and how to do it cheaply), Surviving bad times, Record Keeping, how to estimate your market before you start, Use multiple locations to maximize profits, how to promote and stay steps ahead of the competition! How to get free advertising, free merchandise, free advice, Power negotiating with suppliers to double your profit margins, etc! Even how to keep a present job while starting a business part time!

Don't miss this opportunity to be part of the great industry - the next success story could be your own! Order the manual today! Part one and two bound in a deluxe ring binder, where you can also collect our newsletter (free for six months with the manual - a \$32.50 value!) - all for only \$29.95!



THE COMPUTER ENTREPRENEUR NEWSLETTER - ALL THE LATEST INSIDE BUSINESS NEWS! NOW! SIX MONTHS FREE WITH YOUR MANUAL!

You're always attuned to the industry and your manual kept up-to-date, with our newsletter! Each issue has the latest business news, ideas, new suppliers, our indispensable "watchdog" column on profits, discounts (don't miss just a promissory note, like recently when top video monitor sold at \$60 - that's half wholesale, one third of the retail price!), the competition, the big deals, etc! Feature stories with start-up info and case histories from micro business!

You'll get invitations to trade shows and conventions, the usage of our advisory service and our discount buying service for your purchases!

You'll find many items in our newsletter that will save you the cost of your manual many times over!



CALL TOLL FREE! CHARGE IT!

Credit Card Orders

(MC, VISA only)

accepted 24 hours/day

1-800-227-3800

Ask for extension 1135



Order by phone (Credit cards only), or use the coupon:



MAIL TO: THE COMPUTER ENTREPRENEUR PUBLISHING CO
PO BOX 468, Grand Central Station, New York, N.Y. 10183

Please send me **THE COMPUTER ENTREPRENEUR MANUAL**, and the six month free subscription to **THE COMPUTER ENTREPRENEUR REPORT/NEWSLETTER**. All for only \$29.95, plus \$3 for postage/handling (NY residents: add \$2.64 for sales tax). If I decide not to keep the manual, I may return it within 30 days for a full refund.

NAME: _____

ADDRESS: _____

CITY, STATE, ZIP: _____

☐ Check or M.O. enclosed ☐ Charge to ☐ VISA ☐ MC

CARD# _____

Exp Date _____

SIGNATURE: _____

PC0683



Products for the IBM® PERSONAL COMPUTER

IBM® Compatible Computer

CIRCLE 182 ON READER SERVICE CARD

PULL. PULL. STICK. STICK. CHANGE PERFORMANCE THAT QUICK.



What you see here is a remarkable system that will change the personality of your IBM Personal Computer. A system that makes it possible for you to use your PC to develop applications that normally require the resources of a much bigger computer. A system that quite literally transforms your computer from personal to professional. Here's how:

Easy As A,B,C

First you apply the character labels to your keyboard, then you plug in the custom ROM that will enable your PC to display these new characters. Third, you insert the disk and load the software to complete the change:

APL*PLUS®/PC System from STSC.

Now, instead of limiting yourself to off-the-shelf spreadsheets, word processors, or slow program development in BASIC, you can develop custom solutions to problems that previously were beyond the scope of your PC.

The APL*PLUS/PC System is a complete APL language processor

from STSC, the leading supplier of APL products and services for more than 14 years. It also includes STSC's business report formatting feature, communications capabilities, and data management features.

The APL*PLUS/PC System can interface to non-APL programs and data



stsc
A Contel Company

files so you can integrate your other software packages with the APL*PLUS/PC. And APL programs developed on your PC will run on other desktop computers, minis, and mainframes that support APL. Software developers may license the APL*PLUS/PC System to develop APL applications for resale using a run-time version of the system.

Everything You Need for Application Development

It's all here in our comprehensive package. In addition to the keypad labels, custom ROM, and software manual, you also get a reference manual, an introductory tutorial, and a widely used APL textbook. All for only \$595.*

The APL*PLUS/PC System requires an IBM PC or IBM PC XT with PC DOS at least 192K RAM memory, and one floppy disk drive. To order APL for your PC, call or write STSC, Inc., 2115 East Jefferson Street, Rockville, Maryland 20852, (301) 984-5123.

*U.S.A. price only.

IF YOU'RE CONFUSED ABOUT BUYING A PERSONAL COMPUTER, HERE'S SOME HELP

Computers come in two parts.

One part is the "hardware," the machinery itself. The other is the "software," which tells a computer what to do, the way a driver tells a car what to do.

Without software, a computer can't do anything. And vice versa. You have to buy both.

Buy the software first.

Since the reason you're buying a computer is to get the capability the software gives you (remember it's the software that tells the computer what to do), it makes good sense to pick the software first.

Start by making a list of the things you want the computer to do. Possibilities include word processing, inventory control, accounting, graphics, recordkeeping—you name it, there's probably software that does it.

Next take your list into a computer store and ask the salesperson to demonstrate software that will do the things you want.

Even though you'll need a computer for the demonstration, keep in mind the computer is just a vehicle. The software is the driver. Once you've decided on software, picking the rest of the computer system will be that much easier.

The simpler the better.

Some people will tell you that software has to be complicated to be powerful. Nothing could be further from the truth.

Good personal software should be, as the computer people say, "friendly." Meaning that it helps you do what you want to do without getting in the way.

Good software keeps the complications in the computer, where

they belong. And keeps the capability at your fingertips. It's that simple.

Simply see for yourself.

You can read any number of interesting books and magazines about personal computers. You can ask your friends who have them.

Or look at all the sales literature you can get your hands on.

But as helpful as that can be, there's no substitute for a live demonstration.

When you do go shopping, we recommend you take a look at the PFS® Family of Software.

Designed the way we think a software family should be: simple, straightforward and powerful.



Currently there are four software packages in the family: PFS:WRITE, PFS:FILE, PFS:REPORT and PFS:GRAPH, with more on the way. Here's a little more about each of them.

PFS:WRITE. The simplest way to get your message across.

PFS:WRITE is ideal for people who want to make their writing time more productive. It displays what you write on your computer screen so you can make revisions as you compose.

With WRITE, you can correct misspellings or substitute one portion of text for another, with just a few keystrokes.

And when you're through revising, WRITE shows you "on-screen" just how your document will look when it's printed. So there are no surprises afterwards.

WRITE also works with most popular software programs, including the PFS Family of Software.

This feature allows you to add names and addresses from mailing lists to generate form letters. Or combine columns of numbers or graphs with your text.

PFS:FILE. The simplest way to get organized.

FILE is basically a paper filing system without the paper. So you can record, file, retrieve and review information in a fraction of the time it takes with a conventional filing system.

With FILE, you arrange your information on a "form" you design yourself. And when you need to track something down, FILE sorts through your records electronically. It lets you retrieve information in a variety of ways so you can be as selective as you want.

PFS:REPORT. The simplest way to sum it all up.

REPORT is a powerful analysis tool that works with FILE.

REPORT sorts through your files and retrieves the information you're looking for. Then assembles it all into one report, so you can analyze, plan and make better-informed decisions.

REPORT is also good at math. It quickly sorts through columns of numbers and performs calculations, so you won't have to.

pfs:
report

pfs:
file

pfs:
write

pfs:
graph

PFS:GRAPH. The simplest way to spot trends.

GRAPH is ideally suited for professionals who need charts or graphs in a hurry.

All you do is specify the kind of graph or chart you want and enter the information. GRAPH does the rest.

GRAPH transforms columns of facts and figures into pie, line and bar charts so you can spot trends quickly and make better-informed decisions.

GRAPH works with PFS:WRITE, PFS:FILE, VisiCalc® files or data entered directly into the computer. And supports most popular printers and plotters.

Send for our Free PFS Software Catalog.

It'll tell you more about the PFS Family of Software and how to use it.

It's free. And all you have to do to get one is return the coupon below or see your participating PFS dealer.

The PFS Family of Software.

We've already made computers simpler to use.

Now we're making them simpler to buy.

pfs:

FREE

**PFS
SOFTWARE
CATALOG**

Name _____

Address _____

City _____

State _____ Zip _____

I plan to use a personal computer:

☐ at home ☐ at work ☐ both

Mail to: **PFS, 422 Aldo,
Santa Clara, CA 95050**

*PFS is a registered trademark of Software Publishing Corporation, 1901 Landings Drive, Mountain View, CA 94043. The PFS Family of Software currently runs on the Apple® IBM® Compaq® Texas Instruments® and equivalent personal computers.

CIRCLE 414 ON READER SERVICE CARD

DISCOUNT PLUS FREE SHIPPING!

AST Multi-Function IBM PC Board

\$269 W/64K

(Each Additional 64K For \$60)
(Optional Game Port \$25)



AST SixPakPlus

- ✓ Upgradable To 384K Bytes
- ✓ Clock Calendar
- ✓ Parallel Port
- ✓ Serial Port
- ✓ One Year Warranty
- ✓ Free Software
- ✓ Super Disk
- ✓ Super Spooler

Disk Drives



Shugart Drives

- SA 455
Half Height, Double
Sided, 40 TRK/Sided
Single Or Double Density **\$229**

Tandon Drives

- TM 100-2
5 1/4" Double Sided
40 TRK, 48 TPI **\$239**

Control Data Drives

- CDC 9409
5 1/4" Double Sided
40 TRK, 48 TPI **\$239**

Monitors

- Amdek 310A **\$175**
- Amdek 310G **\$175**
- Gorilla (Green) **\$99**

Software

- Ashton-Tate
D Base II **\$399**
- Lifetree Software
Volkswriter **\$125**
- Lotus
1-2-3 **\$369**
- VisiCorp
Visicalc **\$165**
- MicroPro
Wordstar **\$269**
- Microsoft
Multi Plan **\$179**

Modems

- Hayes Smartmodem
1200B Board
Includes Smartcom II Software
Compatible With Bell 212A or
Bell 103 Type Modem.
Plugs Into One PC Slot. **\$469**



- Hayes Smartmodem:
300 Baud **\$209**
- 1200 Baud **\$499**

Printers

- Epson:
RX 80 (100 CPS, PAR-10") **\$Call**
- RX 80 FT **\$Call**
- FX 80 (180 CPS, PAR-10") **\$Call**
- FX 100 (180 CPS, PAR-15") **\$Call**
- Star-Micronics:
Gemini-10X (120 CPS, PAR-10") **\$299**
- Gemini-15X (120 CPS, PAR-10") **\$439**
- Okidata:
ML82A (120 CPS, SER & PAR-10") **\$395**
- ML92 (160 CPS, PAR-10") **\$489**
- ML83A (120 CPS, SER & PAR-10") **\$659**
- ML93 (180 CPS, PAR-15") **\$849**
- ML84P (200 CPS, PAR-15") **\$990**

High Resolution Color

- Princeton Monitor:
80X25 Lines
690 (H) Dots X 200 (V)
Line Resolution **\$499**
- Colorplus By Plantronics
High Resolution 4 Color 80 Character Color
Medium Resolution 16 Color 40
Character Color **\$375**
- USI Multidisplay Card
Monochromatic Output
Color Graphic Output **\$375**

How To Order: Order by calling CompuAdd Toll Free on 1-800-531-5475 (if outside of Texas) or 1-512-250-1489 (in Texas). You can also order by mail. Orders may be charged to a MasterCard or VISA Account or paid by Cashier's Check or Money Order. We do accept personal checks. Allow 10 days for check processing. We pay shipping and handling on orders delivered in continental U.S.A. Add 5% sales tax if Texas resident. All equipment carries a warranty.



CompuAdd Corp.

ORDER TOLL FREE:
(800) 531-5475 (if outside of Texas)
(512) 250-1489 (in Texas)

13010 Research Blvd., Suite 101, Austin, TX 78750

CIRCLE 17 ON READER SERVICE CARD

Transferring data files from an Apple to PC format can produce many headaches. If you decide to attempt it, here are some suggestions that should help conserve your aspirin supply.

Surviving An Apple To PC Switchover

Your new PC seems to glow in the warm yellow light from your table lamp. You almost can hear "Use me, use me!" whispering from its tiny speaker. But before you can get too involved with your new helpmate, your new love, you have something very important to do.

You have to transfer all your VisiCalc, WordStar, and other business program files from Apple to PC format. After all, you have to break it off completely; no *ménage à trois* for you, hopping from computer to computer.

But had anyone told you that parting with your Apple for a PC would cause such sorrow, you might have thought twice before making the switch. You knew your Apple programs would be useless with the PC, but you felt confident that you could pass along data files with no trouble. "It's a cinch," a friend may have told you. More untrue words could not have been spoken.

The headaches, the confusion, the sleepless nights: All could have been avoided had you known how to play the Apple to PC data file switchover game. And if, by chance, you have yet to make the defection from Apple to PC, take warning from those who have tried: It's not as easy as you think. More computer-literate

hackers than you have attempted it—and failed.

Is all this fuss about switching from an Apple to a PC for real? Look at it this way: Most computer users have a good deal of time and money invested in their data files. Having to rekey information into a new computer is a waste. The better alternative is to transfer information from

FILES
*created with a CP/M
card are often a breeze
to transfer.*

Apple disks to PC disks electronically. This applies, of course, not only to those trading in their Apples for PCs, but also to those who have both computers at their disposal and find that they must occasionally trade data between them.

Several software and hardware schemes are available to make transferring files from an Apple to a PC-format an easier and simpler task. Clearly, some are better than others. But which ones? In fact,

are they really necessary at all? And what about co-processing—putting an Apple board into a PC?

How to Turn the Apple Blue

How is the typical file transferred from an Apple to a PC? The file—say, a WordStar text file, for example—which was created with an Apple using a CP/M card, is retrieved from disk by a standard telecommunications program that allows data capture and data transmission (rather than the more simple "terminal" program that simply allows you to converse with a remote computer). Connected to the Apple is a phone modem, which is plugged into a regular telephone line. Everything is set on the Apple to allow the WordStar file to be transmitted through the modem—all in all, a relatively easy job.

Hooked up to a second phone line is yet another modem. The wires from this one are connected to an IBM PC, which is also using a telecommunications program. This PC is configured to receive data—via the phone modem—from the Apple, and capture it permanently onto disk. A press of a button on both machines begins the operation, which is handled automatically by the software loaded into the machines.

Sounds easy, doesn't it? On closer examination, it becomes clear that the picture isn't so rosy. The rub is that dozens of potential problems lurk in the shadows, ready to pounce on the unsuspecting. First and foremost are the two types of files that both the Apple and the PC can create. One of them lends itself easily to transfer; the other one does not.

The most common type is the ASCII or text file, so named because it uses what's known as ASCII (American Standard Code for Information Interchange) to generate a set of standard alphanumeric characters. Both the Apple and IBM use this code, so in theory, they are compatible.

ASCII is often found in word processing files, although it can also pop up in the dictionaries that compose spelling checkers and the records contained in data management programs. ASCII is the easiest type of file to exchange when going from one computer to another.

Binary, the other major file type, is less easily transferred, and often requires a more specialized communications pro-

gram—one that's specifically engineered to handle binary data files. Binary files are typically found in spreadsheet programs, such as SuperCalc and VisiCalc. They are

***If you
have yet to make the
defection from Apple to
PC, take warning from
those who have tried:
It's not as easy as you
think.***

closely akin to ASCII files, but contain several extra, special purpose characters. The program must be able to process these characters or an unsatisfactory transfer will be the result.

In reality, the Apple and the PC have

very little in common. Consequently, using Apple-created data on an IBM PC is difficult. The operating systems of the two machines format files differently enough that simply transferring the information is virtually useless. That is, unless certain precautions are met. The main problem is that Apple DOS creates files that lack a specific element that MS DOS requires. In addition, some programs used on the Apple create elements that MS DOS cannot tolerate.

More specifically, Apple DOS creates ASCII files where the end of each line is terminated by a carriage return (<CR>). When printing the file out, Apple DOS adds the required line feed (<LF>) to make the printer advance one line at a time.

MS DOS, like CP/M, requires a separate line feed after each carriage return in the file, and does not add one when printing. A file created on an Apple will need line feeds added to it if it is to be used on a PC. Many communication programs have a provision to "add line feeds to carriage return," but some do not. You'll obviously need one that does.

By the way, this is not a problem when using CP/M programs in the Apple (with the use of a CP/M card, of course). An Apple-CP/M file-to-PC file transfer circumvents such hassles (except with some file transfer programs; see sidebar for more details). In fact, files created with a CP/M card are often a breeze to transfer, because CP/M and MS DOS are so alike in their file structure. And if you've been using an 8088 co-processing board in your Apple, you're really in for smooth sailing.

The other problem is even more critical: MS DOS uses certain control characters to perform specialized functions. For instance, one is Ctrl-Z, which is used to denote the end of a file.

Programmers, unaware that Apple program files might someday wind up on a PC, have ignorantly written software that uses many of the special control characters used by MS DOS. It's highly likely that some Apple programs you own use control characters for certain embedded commands, such as underlining and bold-facing. When the PC receives one of the control characters—say a control-Z—it will assume everyone is finished, close the file, and terminate the transfer!

The solution: Take out all the embedded commands and hope the program

Btrieve™

A b-tree based record retrieval system designed to solve all your application's database needs.

- interfaces to BASIC, Pascal, COBOL and C
- multi-key access to any number of files
- duplicate and modifiable keys
- unlimited number of records per file
- built-in file integrity controls
- unsurpassed access speed
- efficient memory utilization

Compare Btrieve's capabilities to any record management or ISAM system available and we are convinced that you will select Btrieve. Write or call for details today. \$145.00



Requires PC-DOS.

Btrieve is a trademark of SoftCraft, Inc.

PC-DOS is a trademark of International Business Machines Corp.

P.O. Box 9802 #590 Austin TX 78766
(512) 346-8380

CIRCLE 404 ON READER SERVICE CARD

WHAT'S THE DIFFERENCE

between Optimal Software's dBASE Interpreter
and Ashton Tate's dBASE II™?



\$400

Well . . . that's not the only difference. Our manuals are readable. We have a few bells and whistles that dBASE II™ doesn't. We provide a full year's free updates. . . That's the *big* difference.

dCLONE™

from Optimal Software

Distributed exclusively by
Programming International
Dealer inquiries welcome

dBASE II is a trademark of Ashton-Tate.
dCLONE is a trademark of Optimal Software.

CIRCLE 336 ON READER SERVICE CARD

\$295 Unconditional
30 day money
back guarantee.

Introducing a sensible solution to the problems of dBASE II™

	dBASE II	The Sensible Solution
Records Per File	65,535	999,999
Maximum Record Size	1,024 bytes	1,536 bytes
Fields Per Record	32	384
Key Fields Per File	7	10
Number of Files Simultaneously Accessible	2	10
Number of Screens Per Program	Limited by system memory	Limited only by system storage
Data Dictionary	No	Yes

We don't mean to debase dBASE II, but if you're looking for a data base manager that's long on features, dBASE II can come up a little short.

For instance, a single dBASE II record can only contain 32 fields. And when you need to share information between one file and another, you can only access two at a time.

So, as good as dBASE II is, its limitations can quickly paint you into an electronic corner.

And that's why we created *The Sensible Solution*.

Finally A sensational relational.

Along with all the usual things you expect from a data base manager, *The Sensible Solution* lets you handle the kind of tough assignments that dBASE II can't.

You can design data files with more than 300 variables. You can create reports using 10 different files at once. You can even set up file locking for multi-user computers.

Ready to get down to business.

A data base manager without ready-to-run application programs is hardly worth the disk it's copied on.

So, along with *The Sensible Solution*, you can also add *The Sensible Solution Bookkeeper™* or *Sensible Management™*, our complete one-entry accounting and management system.

They're both affordable. Business-tested. And supplied with source code so you can make your own modifications.

A sensible trial offer.

When you purchase *The Sensible Solution*, we'll send along a special trial disk that lets you create forms and enter a limited number of records. If, after 30 days, you're not satisfied, just return the unopened master system disk for a full refund.

So why not take us up on our trial offer? You've got nothing to lose.

Except the problems of dBASE II.

The Sensible Solution™

To order, write or call: O'Hanlon Computer Systems, 11058 Main Street, Bellevue, WA 98004 USA. Phone (206) 454-2261. Prices: *The Sensible Solution*—\$695, *Sensible Solution Bookkeeper*—\$495, *Sensible Management*—\$895. In Washington, add 7.9% state tax. VISA, Mastercard and dealer inquiries welcome.

dBASE II is a registered trademark of Ashton-Tate. Sensible Solution, Sensible Solution Bookkeeper and Sensible Solution Management are trademarks of O'Hanlon Computer Systems, Inc.

CIRCLE 467 ON READER SERVICE CARD

ZURAN DEFENDER



For the IBM® Personal Computer

HELP! Zuran needs pilots . . .

The dreaded ECLON's are invading our galaxy!

Your mission is to rescue survivors from damaged ZURAN space ships and to destroy ECLON outposts and space stations. Beware, however, of the ECLON fighters. They are fast and very dangerous.

FUN for the entire family . . .

ZURAN game features:

- Top 10 score display (special top score!)
- Super color graphics and action
- Sound on and off
- Screen color and position adjustments
- Pause and Restart
- Hyperspace and Long Range Scan

ZURAN requires 64k of memory, 1 diskette drive, color/graphics adapter.

To purchase this exciting game, inquire at your local dealer or send check or money order for \$32.50 to ZEE Programming, P.O. Box 340142, Boca Raton, FL 33434, C.O.D.

call (305) 487-2172. Florida residents add 5% sales tax. Dealer inquiries invited.



isn't so poorly written that control characters still exist. An alternative is to make sure your telecommunications program—either on the transmitting or receiving end—can block the control characters. Blocking control characters has both its advantages and disadvantages. Standard ASCII characters, including several of the ones used by the computer, such as carriage return and line feed, take seven data bits to create.

Most special control characters, on the other hand, take eight bits. When transferring, all that's necessary is to turn the eighth bit "off." This is often done for you by the communications program. In other cases, you must specifically tell the pro-

A FILE
*created on an Apple will
need line feeds added to
it if it is to be used on a
PC.*

gram to send seven bit data or alternatively edit the eighth bit out of the file to be transmitted.

In some cases, however, blocking the eighth bit can create big troubles. Perhaps the best example is when transferring WordStar files. Blocking the control characters eliminates all the "soft" carriage returns, those special end-of-line identifiers used by the program that permit easy reformatting of the text. The soft carriage returns become "hard," just as if each line were terminated by pressing the Return key. Change a word or two in the text and you won't be able to reformat the paragraph. Your only recourse is to delete the invisible (to you) hard carriage returns physically at the end of each line so that WordStar can re-create soft returns.

In these cases, when going from the Apple to the PC with identical programs like WordStar, it's wise to make sure data looping does not occur. Otherwise, with a word processing program especially, you'll end up with text and data that are difficult to manage. The best way to ensure compatibility is to find communications programs for both the Apple and the PC that permit binary file

CIRCLE 470 ON READER SERVICE CARD

from Prentice-Hall, Inc.



Animation...automatic run-time options.



Complete libraries of hundreds of highly detailed images...from people to products...energy to entertainment.

VCN EXECUVISION FEATURES:

1. Complete menu-driven operation
2. Full color user manual
3. Tutorial demonstration disk with program
4. Libraries of hundreds of pre-rendered images
5. Electronic cut and paste facility to move, combine or erase any object or text
6. Pie, bar, and line graphs with special automatic PLOT function
7. Animation and motion techniques
8. Automatic run-time options
9. Complete design capabilities
10. 64 color schemes and 10 type styles



VCN EXECUVISION Presentation Graphics Program is designed by Visual Communications Network, Inc. (VCN) for the IBM PC. It is the only presentation graphics package to meet the standards of the **Business and Professional Division** of Prentice-Hall, Inc.

For a demonstration of VCN EXECUVISION, visit your nearest computer store. Or call toll-free 800-345-8112 (PA residents: 800-662-2444), or write to: Denise Baer, Prentice-Hall, Inc., 200 Old Tappan Road, Old Tappan, NJ 07675.

© 1983 Prentice-Hall, Inc.

IBM is the registered trademark of International Business Machines Corporation.

CIRCLE 309 ON READER SERVICE CARD

Awesome!

Unsurpassed!

SFINKS PC

CHESS PROGRAM

The number 1 chess game on the TRS-80 is finally available for your IBM PC, complete with all the user friendly features:

- superior color and monochrome graphics
- problem set-up mode
- dual chess clock
- optional printer output
- save and restore games
- announces checkmates
- infinite levels of play from beginner to expert
- optional audio alert
- take back of multiple moves

Sfinks PC challenges you!
White to mate in 4 moves.



Solution time on your IBM PC
15 seconds (IJ-SP)

64K disk — only \$49.95
plus \$2.00 shipping

To order the finest chess program available, please see your dealer or send check to:

William Fink
Suite 24B, 1105 N. Main St.
Gainesville, FL 32601
or call: (904) 377-4847



Florida Residents please add
5% sales tax

CIRCLE 596 ON READER SERVICE CARD

transfer. With such a program, you're nearly assured of being able to transmit

THE BEST
*way to ensure
compatibility is to find
communications
programs for both the
Apple and the PC that
permit binary file
transfer.*

and receive eight bit data.

Call in the Middleman

Now, for some really bad news. Even though you may elect to use the same brand of program with your PC that you used with the Apple, data files created by the old Apple program may not work with the new PC program, even if you can transfer them intact. If you have been using BPT's accounting software for the Apple, for example, the old data files cannot be used with the PC programs. The Apple and PC software format data differently. Result: gross incompatibility.

Peachtree's accounting software is slightly better engineered, but with an important exception. Its Series 40 Apple programs work only with its Series 40 IBM PC programs. IBM's accounting programs, many of which are also made by Peachtree, will not work with Peachtree Apple software.

Other programs, like IUS' Easywriter word processor, require the use of a conversion program before transfer can begin. To go from one of the Apple Easywriter programs (Original or Professional) to Easywriter II for the PC, a special purpose program must be used to convert Easywriter files to Apple DOS. The conversion program costs extra (of course), but if you are an Easywriter user, your Apple data can't leave home without it.

Some other programs that you might expect to allow easy data transfer may, in fact, prohibit it. One case in point: Programs written under the UCSD p-System. The beauty of the p-System is that pro-

grams and files are supposedly interchangeable between computers. And some business programs written under the p-System do indeed allow fast and efficient file transfer. But Software Publishing's PFS series (PFS:Write, PFS:Groph, etc.) cannot accommodate data transfer from Apple to PC. The company has hinted that a conversion program will become available sometime in the near future, but it has yet to make an official announcement.

But take heart: WordStar and many other business programs are not so limited; compatibility between like programs for the Apple and PC is a sure bet with most of the very popular software packages. For example, VisiCalc and SuperCalc files created on an Apple (or any other computer, for that matter) can be moved to the PC with ease—provided that is, that the communications software can support binary file transfers.

Several programs permit cross transferring to a variety of other programs despite differences in the way the data is formatted. These programs output data in so-called "DIF," or data interchange format. DIF was originated by VisiCorp and is used in their Visi program series, such as VisiCalc and VisiPlot. Many programs, like dBase II, 1-2-3, Chartman, and a slew of others transmit and receive DIF files as well.

For example, data created in VisiCalc can be easily transferred to 1-2-3, even though these programs use totally different data formats. Certain commands used in VisiCalc aren't used by 1-2-3, and so some editing is required by you after the transfer. But changing and adjusting a bit here and there is much easier than rekeying a complex and lengthy file.

If you are having trouble transferring a file, check with your dealer to see if he knows of any reason why it won't work. Occasionally, a file conversion program or other trick will be available to make the job easier. In some cases, it may be necessary for either you or the dealer to contact the software manufacturer for technical help.

Hardware, Software, Nowhere?

The proper telecommunications software, as we've already seen, is paramount to a successful Apple to PC data file transfer. Not only must it be able to transfer both ASCII and binary data, but it must

Our Vision Is Peripheral



Yours Can Be, Too, With Multi-Tech Systems' New Modem For The IBM PC

Expand your horizons. Connect your IBM PC to San Diego, San Antonio, Savannah, and points between. Link up to New York for The Source in D.C. Dial up CompuServe in Ohio, or the corporate mainframe downtown. Swap programs with your pal in Seattle. Transfer files with your friend next door.

Share the latest excitement at Multi-Tech: the MT212PC Intelligent Modem for the IBM PC.

- Plugs into any IBM PC expansion slot.
- Transmits at 0-300 or 1200 bits per second.



MT212PC Board Modem

- Automatically dials, answers, hangs up, redials.
- Stores phone numbers, parameters, log-on sequences.
- Creates, stores, prints, displays, and transfers files.
- No IBM serial card needed... price includes all software.

CIRCLE 453 ON READER SERVICE CARD

At Multi-Tech Systems, our future is new markets for us, and new products for you. Since 1971, we've been building acoustic couplers, direct-connect modems, testers, multiplexers, and now this newest generation of intelligent modems.

The MT212PC modem has a two-year warranty and a suggested retail price, including companion software, of just \$549. For more information, write to Multi-Tech Systems, Inc., 82 Second Avenue SE, New Brighton, Minnesota 55112. Or phone us at 612-631-3550.

TWX 910-563-3610

MULTI-TECH SYSTEMS

The Peripheral Vision People

Trademarks: IBM Personal Computer (IBM PC), International Business Machines Corporation, Blue Jeans Mass Retrieval Service, Dow Jones & Company Inc., The Source Service Telecommunications Corporation, a subsidiary of The Reader's Digest Association, Inc., CompuServe Computer Information Services Division, Columbus, Ohio.

See us at

COMDEX/Fall '83

BOOTH # 3035

also be flexible enough to allow you to add line feed characters and to subtract extraneous control characters at will. It must be more than a simple terminal program, providing both computer-to-computer communication as well as the ability to transmit and receive large data files.

If you already have communications programs for both the Apple and PC, take a close look at the fine print in their manuals. Make sure they fit the description given above. If they don't, you'll need to buy or borrow new ones that do.

On the hardware front, telephone modems are typically used as the interconnection between the Apple and PC. Because modems and phone lines are used, data exchanges are limited to the standard 0 to 300 and 1200-bit-per-second transfer rates. For long files, such as a 30-page report, this slow data rate can mean transfers of 30 minutes to an hour in length. But once started, the process is automatic. Fortunately, when modems are used, the only technical restrictions are that both units are operating at the same speed and that

the communications software has been set up to match the speed of the modems.

An alternative to using modems for

***T**HE PROPER telecommunications software is paramount to a successful Apple to PC data file transfer.*

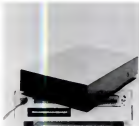
data transfer is the "null modem," a simple multi-wire cable that is connected between an RS-232C serial port on the Apple to an RS-232C serial port on the PC. In essence, a null modem cable is comprised of three wires: a common ground connected to pin 7 on both ports, and two wires for receive and transmit. They are connected in such a way so that pins 2 and 3 of the ports are crossed. Pin 2 of the first

port goes to pin 3 of the second, and pin 2 of the second goes to pin 3 of the first. In this way, data can flow easily between the two ports.

Unfortunately, life is never this easy. Quite often, several of the remaining pins on the port must also be connected—sometimes to the opposite port and sometimes to itself. Each computer serial port requires something different, and it takes reference to the manual to see which pins must be held "high" (receive voltage) or connected to the other port for proper data exchange. Perhaps the easiest way, if you are not technically confident, is to take both computers to a dealer who can diagnose the needs of the two machines.

Null modem cables obviate the need for modems and phone lines. The best part about this method is that if the communications software on both sides of the transfer can accommodate it, data exchanges of 9600 bits per second and faster are possible. That means that lengthy files can be transferred in seconds, not minutes or hours.

FROM M&R TO IBM PC USERS:



SUP'R BUFFER — Lets your printer and computer work simultaneously by providing 64K of memory in buffer storage. Now you don't have to wait for your printer to stop before you return to computer input. Includes independent power supply, auto test, data compression, pause control and with copy capability.



SUP'R EXTENDER — Extends the horizons of your IBM PC by providing six additional peripheral card slots. Has an independent power supply for safe, reliable operation. Self-contained fan to keep components cool. Advanced circuitry for network termination. Easy to install.



SUP'R LEDGER — The most powerful general ledger program ever put on a microcomputer. Handles 200 separate accounts, 1400 transactions per time period, 10 cost centers... your IBM PC never had so much power before. Easy menu driven input for clerical efficiency. Complete with 19 user-defined journal sources.

The SUP'R TREE,
Peripheral and Software
products for your
computing needs



M&R ENTERPRISES
910 George Street
Santa Clara, CA 95050
(408) 980-0160

CIRCLE 447 ON READER SERVICE CARD

Now...Supercharged communications software for your high powered 16 bit PC.

The makers of CROSSTALK proudly announce the newest entry into our line of high performance communications software. CROSSTALK XVI — a communications program with the speed and features of a fine racing machine. Shift from status display to incoming communications and back again at full throttle. Drive smoothly through the program with CROSSTALK XVI's Integrated help system. Enjoy the full use of function keys. CROSSTALK XVI can be used with most autodial modems, and emulates several of the most used terminals. Test drive CROSSTALK XVI today at your local dealer.



CROSSTALK™

XVI

1845 The Exchange / Suite 140 / Atlanta, Georgia 30339 / (404) 952-0267

Dealer orders call toll-free (800) 241-6393

CROSSTALK XVI is a trademark of Microstuf, Inc.



CIRCLE 321 ON READER SERVICE CARD

KEYS TO SUCCESS

Now
available for
IBM PC

The keys to success.

Whether you have a small retail company, manage a service agency or run a cattle ranch, you have to do something else well to build a business—manage money.

You've got to analyze cash flow, see trends and forecast profitability in a time and cost effective manner.

The right fit.

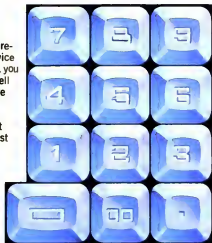
A computerized accounting system makes sense, but finding the right software is important. The "home checkbook" programs are easy to use but they don't have the advanced reporting capabilities you need. And many small businesses just don't need the complexity or the cost of the modular systems.

Practical Accountant™ is a single entry, small business accounting program that comes complete in one package. It's friendly enough to balance your checkbook, yet sophisticated enough to give you the kind of money management information you need for a successful business.

We could have called it "Accounting Made Easy."

Practical Accountant is designed around fundamental accounting procedures. Even if you don't know much about accounting it is an ideal program.

The manual explains basic accounting terminology and provides a comprehensive tutorial. It will take you step-by-step through the process of setting up a complete, single entry accounting system you can begin using right away.



It's quick to learn and convenient to use.

The program guides you with easy-to-use menus and provides on the screen prompting. Practical Accountant even does some of your work for you like organizing entries in date order—even if you don't.

It's very flexible. You set it up to fit your business.

Practical Accountant allows you to set up your "Chart of Accounts" (income and expense categories) with up to 50 categories, 300 sub-categories and with 20 tax type definitions—all

defined by you. The manual shows you how to set up an accounting system for a small business, complete with samples.

Cash Flow Reporting— money management information.

Perhaps the most valuable feature of the program is the cash flow reporting capability. You can look at cash flow by category, by sub-category and by tax type to analyze profitability, tax consequences and general performance. All of your reports are professionally formatted and you have access to profitability information that leads to sound business management.

There is more to this success story.

If you would like to know more about Practical Accountant your dealer can give you a great demonstration and a brochure with a more complete story, or call Softlink TOLL FREE at 800 633-6300 (in CA 800 222-1244) and we will send you the brochure.

Practical Accountant™

Single entry, small business accounting for the Apple IIe, IBM PC and compatibles.

\$149.95
suggested retail

CIRCLE 500 ON READER SERVICE CARD

SOFTLINK

3255-2 Scott Blvd.
Santa Clara, CA 95051
408/988-8011

Practical Accountant is a trademark of Softlink Corporation.
Apple is a registered trademark of Apple Computer, Inc.
IBM is a registered trademark of International Business Machines Corporation.

History has recorded a profound irony.
The fastest and most powerful word processing package ever
created for the IBM personal computer wasn't created by IBM...
or Leading Edge.

The Electric Pencil PC_{T.M.} Word Processing System

Here is one feature of The Electric Pencil PC word processing system with Pencil-ACE and Pencil Tutor:

**Reprogram any key, shift key, control key or alternate key
with up to 255 keystrokes.**

Here are the other 452:

<p>1. [Key] = [Function]</p> <p>2. [Key] = [Function]</p> <p>3. [Key] = [Function]</p> <p>4. [Key] = [Function]</p> <p>5. [Key] = [Function]</p> <p>6. [Key] = [Function]</p> <p>7. [Key] = [Function]</p> <p>8. [Key] = [Function]</p> <p>9. [Key] = [Function]</p> <p>10. [Key] = [Function]</p> <p>11. [Key] = [Function]</p> <p>12. [Key] = [Function]</p> <p>13. [Key] = [Function]</p> <p>14. [Key] = [Function]</p> <p>15. [Key] = [Function]</p> <p>16. [Key] = [Function]</p> <p>17. [Key] = [Function]</p> <p>18. [Key] = [Function]</p> <p>19. [Key] = [Function]</p> <p>20. [Key] = [Function]</p> <p>21. [Key] = [Function]</p> <p>22. [Key] = [Function]</p> <p>23. [Key] = [Function]</p> <p>24. [Key] = [Function]</p> <p>25. [Key] = [Function]</p> <p>26. [Key] = [Function]</p> <p>27. [Key] = [Function]</p> <p>28. [Key] = [Function]</p> <p>29. [Key] = [Function]</p> <p>30. [Key] = [Function]</p> <p>31. [Key] = [Function]</p> <p>32. [Key] = [Function]</p> <p>33. [Key] = [Function]</p> <p>34. [Key] = [Function]</p> <p>35. [Key] = [Function]</p> <p>36. [Key] = [Function]</p> <p>37. [Key] = [Function]</p> <p>38. [Key] = [Function]</p> <p>39. [Key] = [Function]</p> <p>40. [Key] = [Function]</p> <p>41. [Key] = [Function]</p> <p>42. [Key] = [Function]</p> <p>43. [Key] = [Function]</p> <p>44. [Key] = [Function]</p> <p>45. [Key] = [Function]</p> <p>46. [Key] = [Function]</p> <p>47. [Key] = [Function]</p> <p>48. [Key] = [Function]</p> <p>49. [Key] = [Function]</p> <p>50. [Key] = [Function]</p> <p>51. [Key] = [Function]</p> <p>52. [Key] = [Function]</p> <p>53. [Key] = [Function]</p> <p>54. [Key] = [Function]</p> <p>55. [Key] = [Function]</p> <p>56. [Key] = [Function]</p> <p>57. [Key] = [Function]</p> <p>58. [Key] = [Function]</p> <p>59. [Key] = [Function]</p> <p>60. [Key] = [Function]</p> <p>61. [Key] = [Function]</p> <p>62. [Key] = [Function]</p> <p>63. [Key] = [Function]</p> <p>64. [Key] = [Function]</p> <p>65. [Key] = [Function]</p> <p>66. [Key] = [Function]</p> <p>67. [Key] = [Function]</p> <p>68. [Key] = [Function]</p> <p>69. [Key] = [Function]</p> <p>70. [Key] = [Function]</p> <p>71. [Key] = [Function]</p> <p>72. [Key] = [Function]</p> <p>73. [Key] = [Function]</p> <p>74. [Key] = [Function]</p> <p>75. [Key] = [Function]</p> <p>76. [Key] = [Function]</p> <p>77. [Key] = [Function]</p> <p>78. [Key] = [Function]</p> <p>79. [Key] = [Function]</p> <p>80. [Key] = [Function]</p> <p>81. [Key] = [Function]</p> <p>82. [Key] = [Function]</p> <p>83. [Key] = [Function]</p> <p>84. [Key] = [Function]</p> <p>85. [Key] = [Function]</p> <p>86. [Key] = [Function]</p> <p>87. [Key] = [Function]</p> <p>88. [Key] = [Function]</p> <p>89. [Key] = [Function]</p> <p>90. [Key] = [Function]</p> <p>91. [Key] = [Function]</p> <p>92. [Key] = [Function]</p> <p>93. [Key] = [Function]</p> <p>94. [Key] = [Function]</p> <p>95. [Key] = [Function]</p> <p>96. [Key] = [Function]</p> <p>97. [Key] = [Function]</p> <p>98. [Key] = [Function]</p> <p>99. [Key] = [Function]</p> <p>100. [Key] = [Function]</p> <p>101. [Key] = [Function]</p> <p>102. [Key] = [Function]</p> <p>103. [Key] = [Function]</p> <p>104. [Key] = [Function]</p> <p>105. [Key] = [Function]</p> <p>106. [Key] = [Function]</p> <p>107. [Key] = [Function]</p> <p>108. [Key] = [Function]</p> <p>109. [Key] = [Function]</p> <p>110. [Key] = [Function]</p> <p>111. [Key] = [Function]</p> <p>112. [Key] = [Function]</p> <p>113. [Key] = [Function]</p> <p>114. [Key] = [Function]</p> <p>115. [Key] = [Function]</p> <p>116. [Key] = [Function]</p> <p>117. [Key] = [Function]</p> <p>118. [Key] = [Function]</p> <p>119. [Key] = [Function]</p> <p>120. [Key] = [Function]</p> <p>121. [Key] = [Function]</p> <p>122. [Key] = [Function]</p> <p>123. [Key] = [Function]</p> <p>124. [Key] = [Function]</p> <p>125. [Key] = [Function]</p> <p>126. [Key] = [Function]</p> <p>127. [Key] = [Function]</p> <p>128. [Key] = [Function]</p> <p>129. [Key] = [Function]</p> <p>130. [Key] = [Function]</p> <p>131. [Key] = [Function]</p> <p>132. [Key] = [Function]</p> <p>133. [Key] = [Function]</p> <p>134. [Key] = [Function]</p> <p>135. [Key] = [Function]</p> <p>136. [Key] = [Function]</p> <p>137. [Key] = [Function]</p> <p>138. [Key] = [Function]</p> <p>139. [Key] = [Function]</p> <p>140. [Key] = [Function]</p> <p>141. [Key] = [Function]</p> <p>142. [Key] = [Function]</p> <p>143. [Key] = [Function]</p> <p>144. [Key] = [Function]</p> <p>145. [Key] = [Function]</p> <p>146. [Key] = [Function]</p> <p>147. [Key] = [Function]</p> <p>148. [Key] = [Function]</p> <p>149. [Key] = [Function]</p> <p>150. [Key] = [Function]</p> <p>151. [Key] = [Function]</p> <p>152. [Key] = [Function]</p> <p>153. [Key] = [Function]</p> <p>154. [Key] = [Function]</p> <p>155. [Key] = [Function]</p> <p>156. [Key] = [Function]</p> <p>157. [Key] = [Function]</p> <p>158. [Key] = [Function]</p> <p>159. [Key] = [Function]</p> <p>160. [Key] = [Function]</p> <p>161. [Key] = [Function]</p> <p>162. [Key] = [Function]</p> <p>163. [Key] = [Function]</p> <p>164. [Key] = [Function]</p> <p>165. [Key] = [Function]</p> <p>166. [Key] = [Function]</p> <p>167. [Key] = [Function]</p> <p>168. [Key] = [Function]</p> <p>169. [Key] = [Function]</p> <p>170. [Key] = [Function]</p> <p>171. [Key] = [Function]</p> <p>172. [Key] = [Function]</p> <p>173. [Key] = [Function]</p> <p>174. [Key] = [Function]</p> <p>175. [Key] = [Function]</p> <p>176. [Key] = [Function]</p> <p>177. [Key] = [Function]</p> <p>178. [Key] = [Function]</p> <p>179. [Key] = [Function]</p> <p>180. [Key] = [Function]</p> <p>181. [Key] = [Function]</p> <p>182. [Key] = [Function]</p> <p>183. [Key] = [Function]</p> <p>184. [Key] = [Function]</p> <p>185. [Key] = [Function]</p> <p>186. [Key] = [Function]</p> <p>187. [Key] = [Function]</p> <p>188. [Key] = [Function]</p> <p>189. [Key] = [Function]</p> <p>190. [Key] = [Function]</p> <p>191. [Key] = [Function]</p> <p>192. [Key] = [Function]</p> <p>193. [Key] = [Function]</p> <p>194. [Key] = [Function]</p> <p>195. [Key] = [Function]</p> <p>196. [Key] = [Function]</p> <p>197. [Key] = [Function]</p> <p>198. [Key] = [Function]</p> <p>199. [Key] = [Function]</p> <p>200. [Key] = [Function]</p> <p>201. [Key] = [Function]</p> <p>202. [Key] = [Function]</p> <p>203. [Key] = [Function]</p> <p>204. [Key] = [Function]</p> <p>205. [Key] = [Function]</p> <p>206. [Key] = [Function]</p> <p>207. [Key] = [Function]</p> <p>208. [Key] = [Function]</p> <p>209. [Key] = [Function]</p> <p>210. [Key] = [Function]</p> <p>211. [Key] = [Function]</p> <p>212. [Key] = [Function]</p> <p>213. [Key] = [Function]</p> <p>214. [Key] = [Function]</p> <p>215. [Key] = [Function]</p> <p>216. [Key] = [Function]</p> <p>217. [Key] = [Function]</p> <p>218. [Key] = [Function]</p> <p>219. [Key] = [Function]</p> <p>220. [Key] = [Function]</p> <p>221. [Key] = [Function]</p> <p>222. [Key] = [Function]</p> <p>223. [Key] = [Function]</p> <p>224. [Key] = [Function]</p> <p>225. [Key] = [Function]</p> <p>226. [Key] = [Function]</p> <p>227. [Key] = [Function]</p> <p>228. [Key] = [Function]</p> <p>229. [Key] = [Function]</p> <p>230. [Key] = [Function]</p> <p>231. [Key] = [Function]</p> <p>232. [Key] = [Function]</p> <p>233. [Key] = [Function]</p> <p>234. [Key] = [Function]</p> <p>235. [Key] = [Function]</p> <p>236. [Key] = [Function]</p> <p>237. [Key] = [Function]</p> <p>238. [Key] = [Function]</p> <p>239. [Key] = [Function]</p> <p>240. [Key] = [Function]</p> <p>241. [Key] = [Function]</p> <p>242. [Key] = [Function]</p> <p>243. [Key] = [Function]</p> <p>244. [Key] = [Function]</p> <p>245. [Key] = [Function]</p> <p>246. [Key] = [Function]</p> <p>247. [Key] = [Function]</p> <p>248. [Key] = [Function]</p> <p>249. [Key] = [Function]</p> <p>250. [Key] = [Function]</p> <p>251. [Key] = [Function]</p> <p>252. [Key] = [Function]</p> <p>253. [Key] = [Function]</p> <p>254. [Key] = [Function]</p> <p>255. [Key] = [Function]</p>	<p>256. [Key] = [Function]</p> <p>257. [Key] = [Function]</p> <p>258. [Key] = [Function]</p> <p>259. [Key] = [Function]</p> <p>260. [Key] = [Function]</p> <p>261. [Key] = [Function]</p> <p>262. [Key] = [Function]</p> <p>263. [Key] = [Function]</p> <p>264. [Key] = [Function]</p> <p>265. [Key] = [Function]</p> <p>266. [Key] = [Function]</p> <p>267. [Key] = [Function]</p> <p>268. [Key] = [Function]</p> <p>269. [Key] = [Function]</p> <p>270. [Key] = [Function]</p> <p>271. [Key] = [Function]</p> <p>272. [Key] = [Function]</p> <p>273. [Key] = [Function]</p> <p>274. [Key] = [Function]</p> <p>275. [Key] = [Function]</p> <p>276. [Key] = [Function]</p> <p>277. [Key] = [Function]</p> <p>278. [Key] = [Function]</p> <p>279. [Key] = [Function]</p> <p>280. [Key] = [Function]</p> <p>281. [Key] = [Function]</p> <p>282. [Key] = [Function]</p> <p>283. [Key] = [Function]</p> <p>284. [Key] = [Function]</p> <p>285. [Key] = [Function]</p> <p>286. [Key] = [Function]</p> <p>287. [Key] = [Function]</p> <p>288. [Key] = [Function]</p> <p>289. [Key] = [Function]</p> <p>290. [Key] = [Function]</p> <p>291. [Key] = [Function]</p> <p>292. [Key] = [Function]</p> <p>293. [Key] = [Function]</p> <p>294. [Key] = [Function]</p> <p>295. [Key] = [Function]</p> <p>296. [Key] = [Function]</p> <p>297. [Key] = [Function]</p> <p>298. [Key] = [Function]</p> <p>299. [Key] = [Function]</p> <p>300. [Key] = [Function]</p> <p>301. [Key] = [Function]</p> <p>302. [Key] = [Function]</p> <p>303. [Key] = [Function]</p> <p>304. [Key] = [Function]</p> <p>305. [Key] = [Function]</p> <p>306. [Key] = [Function]</p> <p>307. [Key] = [Function]</p> <p>308. [Key] = [Function]</p> <p>309. [Key] = [Function]</p> <p>310. [Key] = [Function]</p> <p>311. [Key] = [Function]</p> <p>312. [Key] = [Function]</p> <p>313. [Key] = [Function]</p> <p>314. [Key] = [Function]</p> <p>315. [Key] = [Function]</p> <p>316. [Key] = [Function]</p> <p>317. [Key] = [Function]</p> <p>318. [Key] = [Function]</p> <p>319. [Key] = [Function]</p> <p>320. [Key] = [Function]</p> <p>321. [Key] = [Function]</p> <p>322. [Key] = [Function]</p> <p>323. [Key] = [Function]</p> <p>324. [Key] = [Function]</p> <p>325. [Key] = [Function]</p> <p>326. [Key] = [Function]</p> <p>327. [Key] = [Function]</p> <p>328. [Key] = [Function]</p> <p>329. [Key] = [Function]</p> <p>330. [Key] = [Function]</p> <p>331. [Key] = [Function]</p> <p>332. [Key] = [Function]</p> <p>333. [Key] = [Function]</p> <p>334. [Key] = [Function]</p> <p>335. [Key] = [Function]</p> <p>336. [Key] = [Function]</p> <p>337. [Key] = [Function]</p> <p>338. [Key] = [Function]</p> <p>339. [Key] = [Function]</p> <p>340. [Key] = [Function]</p> <p>341. [Key] = [Function]</p> <p>342. [Key] = [Function]</p> <p>343. [Key] = [Function]</p> <p>344. [Key] = [Function]</p> <p>345. [Key] = [Function]</p> <p>346. [Key] = [Function]</p> <p>347. [Key] = [Function]</p> <p>348. [Key] = [Function]</p> <p>349. [Key] = [Function]</p> <p>350. [Key] = [Function]</p> <p>351. [Key] = [Function]</p> <p>352. [Key] = [Function]</p> <p>353. [Key] = [Function]</p> <p>354. [Key] = [Function]</p> <p>355. [Key] = [Function]</p> <p>356. [Key] = [Function]</p> <p>357. [Key] = [Function]</p> <p>358. [Key] = [Function]</p> <p>359. [Key] = [Function]</p> <p>360. [Key] = [Function]</p> <p>361. [Key] = [Function]</p> <p>362. [Key] = [Function]</p> <p>363. [Key] = [Function]</p> <p>364. [Key] = [Function]</p> <p>365. [Key] = [Function]</p> <p>366. [Key] = [Function]</p> <p>367. [Key] = [Function]</p> <p>368. [Key] = [Function]</p> <p>369. [Key] = [Function]</p> <p>370. [Key] = [Function]</p> <p>371. [Key] = [Function]</p> <p>372. [Key] = [Function]</p> <p>373. [Key] = [Function]</p> <p>374. [Key] = [Function]</p> <p>375. [Key] = [Function]</p> <p>376. [Key] = [Function]</p> <p>377. [Key] = [Function]</p> <p>378. [Key] = [Function]</p> <p>379. [Key] = [Function]</p> <p>380. [Key] = [Function]</p> <p>381. [Key] = [Function]</p> <p>382. [Key] = [Function]</p> <p>383. [Key] = [Function]</p> <p>384. [Key] = [Function]</p> <p>385. [Key] = [Function]</p> <p>386. [Key] = [Function]</p> <p>387. [Key] = [Function]</p> <p>388. [Key] = [Function]</p> <p>389. [Key] = [Function]</p> <p>390. [Key] = [Function]</p> <p>391. [Key] = [Function]</p> <p>392. [Key] = [Function]</p> <p>393. [Key] = [Function]</p> <p>394. [Key] = [Function]</p> <p>395. [Key] = [Function]</p> <p>396. [Key] = [Function]</p> <p>397. [Key] = [Function]</p> <p>398. [Key] = [Function]</p> <p>399. [Key] = [Function]</p> <p>400. [Key] = [Function]</p> <p>401. [Key] = [Function]</p> <p>402. [Key] = [Function]</p> <p>403. [Key] = [Function]</p> <p>404. [Key] = [Function]</p> <p>405. [Key] = [Function]</p> <p>406. [Key] = [Function]</p> <p>407. [Key] = [Function]</p> <p>408. [Key] = [Function]</p> <p>409. [Key] = [Function]</p> <p>410. [Key] = [Function]</p> <p>411. [Key] = [Function]</p> <p>412. [Key] = [Function]</p> <p>413. [Key] = [Function]</p> <p>414. [Key] = [Function]</p> <p>415. [Key] = [Function]</p> <p>416. [Key] = [Function]</p> <p>417. [Key] = [Function]</p> <p>418. [Key] = [Function]</p> <p>419. [Key] = [Function]</p> <p>420. [Key] = [Function]</p> <p>421. [Key] = [Function]</p> <p>422. [Key] = [Function]</p> <p>423. [Key] = [Function]</p> <p>424. [Key] = [Function]</p> <p>425. [Key] = [Function]</p> <p>426. [Key] = [Function]</p> <p>427. [Key] = [Function]</p> <p>428. [Key] = [Function]</p> <p>429. [Key] = [Function]</p> <p>430. [Key] = [Function]</p> <p>431. [Key] = [Function]</p> <p>432. [Key] = [Function]</p> <p>433. [Key] = [Function]</p> <p>434. [Key] = [Function]</p> <p>435. [Key] = [Function]</p> <p>436. [Key] = [Function]</p> <p>437. [Key] = [Function]</p> <p>438. [Key] = [Function]</p> <p>439. [Key] = [Function]</p> <p>440. [Key] = [Function]</p> <p>441. [Key] = [Function]</p> <p>442. [Key] = [Function]</p> <p>443. [Key] = [Function]</p> <p>444. [Key] = [Function]</p> <p>445. [Key] = [Function]</p> <p>446. [Key] = [Function]</p> <p>447. [Key] = [Function]</p> <p>448. [Key] = [Function]</p> <p>449. [Key] = [Function]</p> <p>450. [Key] = [Function]</p> <p>451. [Key] = [Function]</p> <p>452. [Key] = [Function]</p>
--	--

Electric Pencil PC is on sale now. See an incredible demonstration of word processing power at your computer dealer today. Don't take our word for it... See it for yourself.

Electric Pencil - \$299.95, Pencil Tutor - \$49.95 and Pencil-ACE - \$149.95. The Electric Pencil PC PRO-Pak (includes The Electric Pencil, Pencil Tutor and Pencil-ACE) - \$499.95. In addition you will receive a \$50 rebate when you return the coupon included with every PRO-Pak. This offer good on purchases of the PRO-Pak only.

The Electric Pencil is available at computer stores and selected B. Dalton Booksellers. If your dealer is out of stock, order direct. Include \$4.00 for shipping and handling. Foreign residents add \$11.00 plus purchase price in U.S. Funds.

Dealers

The Electric Pencil is available from IJG, Inc. 1-714-946-5805, Telex 469775 IJG/GIINC. International Dealers contact Laurant Martres at IJG, Inc. or contact one of the following distributors or dealers:

• Australia: Dick Smith Electronics - (02) 888 32 00 • Belgium: Immo-Elec Sprl - 02/640 73 01 • Belgium: Micro-2000 - 733 65 40
• Canada: Micron Distributors - (416) 593-9862 • Canada: Microwest Dist. (604) 984-9191 • Denmark: E.C. Data - (2) 81 81 91
• England: Molimerx Ltd. - 0424/220391 • France: Pentasonic - 524 2316 • France: Alpha Systemes - 76/478067 • France: Sideg Informatique - 557 79 12 • France: Siven S.A. - 522 70 66
• Germany: Hofacker GMBH - (08024) 7331 • India: Lord International - 272375 • Netherlands: Computer Collectief - 20/223573 • South Africa: Technical Books (Pty) Ltd. - 21-6540

CIRCLE 256 ON READER SERVICE CARD

If it's from 
IT'S JUST GREAT!

Electric Pencil PC is a trademark of Michael Shroyer Software

THE TOWER OF BABEL CONQUERED!

In the Old Testament, man's excessive ambition results in the Tower of Babel where no one speaks the same language. In Modern Times, the microcomputer industry has achieved the same result without any direct divine intervention. Now, with Xeno-Copy PLUS, you can read AND write over 35 different disk formats in your IBM PC or PC-compatible.

Place your "foreign" disk in your PC. READ and WRITE files between PC-DOS and your "foreign" disk. No modems, serial links, or other hardware required. Capabilities include single and double-sided formats.



CP/M-80, CP/M-86, TRSDOS, p-SYSTEM, and others.

The fast and easy way to move disk files TO and FROM your other computer, using your PC as the host computer. Your other computer is not required, just the disk. Fully menu-driven and easy to use.

Xeno-Copy PLUS gets you the best in user support. Your Xeno-Copy package contains our toll-free (800) technical support hotline number. All Vertex registered users receive a free subscription to our newsletter "XENOTES" containing helpful info and upgrade notices.

Xeno-Copy PLUS available for the IBM PC and most PC-compatibles. Become a Xeno disciple for only \$149.50.

THE PC KEYBOARD ... CONQUERED

Smile thru keyboard limitations with KEYSWAPPER 2.0's punch! First, customize your keyboard. Use four different built-in keyboard layouts including DVORAK (ANSI). Move any key. Use numeric keypad and cursor controls at the same time. Hear audible feedback on CAPSLOCK/NUMLOCK, and reset CAPSLOCK like typewriter. Menu-driven for easy setup.

Then, add the most powerful macro-command capability around. Program ANY key as a macro—even relocated keys or multiple keys. Most macro features can be changed even while another program is running: define a new macro, toggle any KEYSWAPPER feature on/off including macros, bring up a macro definition table and "help screen". Macros can contain user input and time delays. Create "phantom" menus transparent to your application program. Save macros in printable, editable files. Optional date/time at cursor prompt, disable selected keys, and other advanced features.

Works for you on the PC, XT and selected PC-compatibles, under DOS 1.1 and 2.0. Compatible with most popular programs. Only 80 shekels (\$79.95 U.S. currency).

THE ORIGINAL KEYFIXER™

An original gift from the three wise men? Probably not, but these precision molded collars fit onto the existing ENTER, TAB, BACKSPACE, and both SHIFT KEYS to increase accuracy and reduce fatigue. Unique design does not change key height. Imprinted with "ENTER" as in IBM manuals. Original equipment grey color matches existings keys. A thousand and one satisfied customers.

Set of FIVE only \$14.95



Check with your local retailer, or call us for your local Vertex dealer.

Vertex
systems

Dept M, 7950 W. Fourth St.,
Los Angeles, CA 90048
(213) 938-0857

If unavailable locally, send payment or VISA/MC with card # and exp. date. Phone orders accepted.
Add \$2.00 ship/handling. CA residents add 6 1/2% sales tax.

CIRCLE 482 ON READER SERVICE CARD

PC MAGAZINE 386 NOVEMBER 1983

Another alternative is to "print" the data out, and avoid complex modems, null modem cables, and phone lines altogether. This method is particularly suitable for transferring word processing files where embedded commands and soft carriage returns aren't required.

To print data into the PC, simply set the Apple and software—equipped with an RS-232C port—into print mode. Instead of etteching a printer to the other end of the serial cable, attach the PC's RS-232C port (a cable with lines 2 and 3 crossed, as described above, is again required; the additional support lines are typically not).

Drop a communications program into the PC, set it so that it accepts data at the same rate that the Apple is sending it out, and begin "printing." Apple's problem of absent line feeds is avoided here since the line feeds are added for printout.

An alternative to all this is using a co-processor board inside your PC—one that provides all the electronic guts necessary to run Apple programs. So far, only one company has a board that provides such co-processing power: Quadram's Quadlink. At \$680, you'll want to make this purchasing decision carefully. You'll also want to test your software and data files thoroughly on a Quadlink board before you buy it and take it home. The board may not be able to read all of your diskettes—particularly the copy-protected ones.

If you don't have all the software and hardware required to do Apple to PC data transfers, and don't want to spend more buying extra gear, try tapping the resources of friends or business associates. Since transferring is often a one-shot deal—do it once and it's over—short-term borrowing shouldn't pose too much of a problem. Feeling this, contact your dealer for help, but don't expect him to do it for free (unless he promised you he would when you bought the PC from him in the first place). Expect a charge of no more than \$25 an hour, a price you'll find that's well worth it.

Finally, when it's all over, when you've transferred all of your files, go ahead and sit back, relax, and enjoy your new-found digital helpmate. One of the hardest computing jobs you'll ever likely do is behind you now—unless, that is, you decide to change computers again or add new ones to the mix. /PC

Transferring Files: One User's Account

An IBM PC user describes how he survived the switchover from an Apple II.

When I recently purchased an IBM PC, I faced an increasingly common problem: how to transfer files from the Apple II I had owned for a year and a half to my new micro. According to most of the magazines, dealers, and my computer friends, the best, easiest Apple/IBM file transfer program available was Alpha Software's Apple-IBM Connection, a \$200 package that includes diskettes for both computers, and full documentation "so simple that even a 5-year old child could run it." I had to dig down a little deeper in my wallet to spring for a \$300 modem for the IBM, which I decided I would need anyway for calling up bulletin boards and other services. Fortunately, I already had a modem for the Apple, which made the whole operation a little less painful to my pocketbook.

I perused the manual carefully. The manufacturer had thrown in an audiocassette for additional instructions. I sniffed loftily at the cassette and opted for reading the documentation instead. It looked simple enough—at least, until I ran across a mention of Apple CP/M. It seemed that the Apple-IBM Connection couldn't transfer Apple CP/M files directly; they first had to be transferred to standard Apple DOS ASCII textfiles, using the "CPM to DOS" utility provided on the Apple diskette. (Apple BASIC and binary files also must be similarly converted before transferring.)

No problem, I thought. I grabbed a backup file of a recent story I had written, dropped it into the slot, and ran the program. The drives whirled and stopped. And whirled and stopped. While this went on, I waited. And waited. Just as I was about to doze off, the prompt popped back on the screen. It was done. Sure, it took awhile—about 10 minutes for a 10-page file—but at least that part of the operation

was completed.

Now, to transfer it over to the IBM. I ran a 20-foot modular telephone cable from my Apple modem to my IBM modem and fired up the PC, with the IBM program installed. After a brief wait, the PC sud-

YOU HAVE
to keep a close eye on both the Apple and IBM monitors, since neither computer gives you an audible signal when the transfer is completed.

dently started beeping angrily, flashing the message, "A FATAL ERROR HAS BEEN DISCOVERED." I cringed. "What could I have done wrong?" I asked. The computer didn't reply, so I reread the instructions, checked the cable, and made sure the modems were working properly. Still no luck. I tried calling my dealer, who told me, "Duh, gee, well, we've never actually sold one of these before, and I don't have time to open one up and actually try it." I thanked him for his exemplary assistance and tried calling the manufacturer's hotline, which was constantly busy (I assumed I wasn't the only one having trouble with this program). As a last resort, I called an independent computer consultant friend of mine who talked me through the set up.

My end of the conversation went like this: "Nope, I tried that already." "Yep, checked that, too." "Of course I tried different cables!" "Yes, I'm using the right

sync port." "Whaddya mean, go see if the modems are plugged in?" "What do you take me for, an idiot?" "Oh, thanks a lot!" Eventually, we tracked down the problem, which was two-fold. First, although the program can run with a Mountain Hardware CPS Apple Card in slot #2 or #3, it only works with a regular modem in slot #3. My Apple was equipped with a standard D.C. Hayes MicroModem, but since my 80-column card was already in slot #3, I had to do some board-swapping to get this to work. That, said my friend, would do the trick.

Wrong. Again, the nasty "beep-beep-beep" snarled from the IBM's internal speaker, with the flashing "FATAL ERROR" message appearing on the screen, again reminding me of my own incompetence. Again, my friend the technician came through. It seemed that for normal modem communication, you needed to set the DIP switches of the IBM SmartModem to "1, 3, 6 and 7 on," which is pretty much the way it came out of the box. For the Apple-IBM Connection, however, only Switch 7 is left on. This sneaky fact was omitted from the manual's 106 pages—or, at least, if it was there, I couldn't find it after reading it from cover to cover half-a-dozen times.

Feeling somewhat like a mad scientist, I pushed the appropriate buttons on both computers at the same time and held my breath. I began to turn blue. Once more I waited. And waited. No error message. No "beep-beep-beep." Just silence. Just as I was beginning to give up hope, the screens cleared and a cheerful "LINK ESTABLISHED" message appeared. My heart skipped a beat as I tossed in the appropriate text file disks in the appropriate slots and pounded the filenames in on the two keyboards.

Again, I hit the right buttons and

CHESS

SDL Presents SPOC™

(Selective Pruning Optimization Chess)
the Chessmaster

Finally, Chess for the IBM PC is available !!!! The strategy of chess, which has fascinated people for centuries, combined with a new, state of the art algorithm we call Selective Pruning Optimization allow S.P.O.C. to play exciting, challenging chess at nine different skill levels, including a level designed for tournament play.

SPOC features:

- Excellent color graphics
- Dual chess clocks
- Save and Resume option
- Cursor controlled piece movement
- Optional printer output
- Nine skill levels
- Monochrome display also (without graphics)

A Classic Game for the Serious Gameplayer
Created by Jacques F. Middlecoff

To order, call Toll-free

1 - 800 - 321-3900

System Requirements

Master Card \$39.95
Visa, COD
Accepted

SDL Corporation
50 West Brokaw Road Ste. 64
San Jose, California 95110

IBM Personal Computer
128K Bytes Memory

© Copyright 1983
Cypress Software
All Rights Reserved

OEM Inquiries Welcome
CIRCLE 449 ON READER SERVICE CARD

preyed. Once more, after a brief wait, the screens vanished and showed me the modes of the two machines ("SEND" for the Apple and "RECEIVE" for the IBM), with a strange "Sterzag Units Transferred" message, which referred to the amount of data flowing through the cable from one computer to the other. Once more, I nearly nodded off to sleep, as the entire transfer program took well over 10 minutes. I noted that throughout all these procedures, you have to keep a close eye on both the Apple and IBM monitors, since neither computer gives you an audible signal when the transfer is completed—a big disadvantage, in my book.

Once transferred, I checked the file on the IBM. It seemed great, except that on the right column, where I normally see a neat vertical row of spaces, dots or "less than" symbols (<), there was nothing but dashes. Despite the fact that it was already 3 A.M. I rubbed my weary eyes, shook my head, and decided that this must be the "eighth bit" problem my friend had warned me about. Sure enough, when I attempted to edit the file, WordStar treated it as if it were a single line, 5000 characters across, instead of being a 600-line, 10-page article. Needless to say, editing a file like this is unruly, at best, so I again plowed through the Apple-IBM Connection manual to find a solution.

Once more, I had to use a utility program—"Reform"—to add line feeds to the

IT TOOK
*nearly 45 minutes to
convert, transfer, and
reconvert a simple 10-
page article.*

document. This seemed like no big deal, so I loaded BASIC and ran the program. And waited ... and waited ... and waited, until I was sorely tempted to bludgeon the IBM. Meanwhile, the Apple II snickered on a table across the room as I silently glared back in response.

All told, it took nearly 45 minutes to convert, transfer, and reconvert a simple 10-page article. And that's not all: I dis-

covered that sometimes, either the IBM or the Apple (usually the latter) hangs up and begins spitting out data erratically, without warning. I learned to check files constantly, to make sure they were being transferred correctly; once I found an old article that got stuck in the middle and endlessly repeated the letter P for the rest of the document, as if it were written by a stuttering P-P-Porky P-Pig. Another time, I opened a transferred file on the IBM to check it and discovered a screenful of garbage, looking all the world like a digital representation of alphabet soup. Even though you can't edit them, I found it's a good idea to check the files as early as possible, to avoid wasting precious time trying to convert and reform a bombed text-file.

One particularly irksome problem that comes up all the time is the tendency of the transfer program to drop off spaces between sentences, placing one space instead of the usual two between them. Sometimes, the spaces are on the screen but won't print properly; other times, they aren't on the screen, either. I also discovered an unusual quirk of the Apple CP/M-to-DOS conversion utility, which seemed unable to convert any files with lines longer than 80 characters. For these, I really had no choice but to print them out on the Apple and retype them by hand on the IBM. As a matter of fact, my writing partner (who had been chuckling and clucking his tongue throughout this entire escapade) laughingly advised that it would probably go faster if I just re-keystroked everything. Except for the longest files, it probably would be faster, depending on your typing skills. But I was determined to get my money's worth out of the program, even if it killed me.

So far, it hasn't. But even at this late date, a month after buying the Apple-IBM Connection, all my files aren't yet transferred. The bulk of the important articles is done, but there are plenty of minor correspondence disks and miscellaneous files yet to do. Since I spend most of my waking hours writing, there isn't a lot of time left to sit around and transfer files. I did learn a couple of tricks to help make the conversion and transfer process go a little faster. First, get two monitors to help you keep an eye on both computers while they're running.

Since I had only one green screen, I

was forced to use an ordinary tv set with the Apple, which wasn't quite adequate for checking 80-column CP/M files, but it was enough to get me through the transfer

I COULD'VE easily grown a beard while waiting for the files to transfer.

program itself. Also, I kept careful records of which files I was transferring, making sure I kept the same names whenever possible, except when the filenames weren't allowed by PC-DOS. When using the "Reform" program, I used my electronic RAM disk to help speed up the BASIC program, to minimize any reading/writing delays. Last, I used an alarm clock to buzz me at 10-15 minute intervals, to remind me to check each computer to see how the "Sterzag Units" were coming along, and to see when the transfer was finished.

Since You Asked . . .

What improvements would I make on the Apple-IBM Connection? Well, for one, anybody considering using it would be a lot better off making the file transfers at 1200 baud instead of 300. I tell you, I could've easily grown a beard while waiting for the files to transfer, with the date trickling through like grains of sand through an hourglass. Unfortunately, my modems could only handle the slower speed; more's the pity. Next, I think Alpha Software would do well to program in an audible cue whenever the file conversion or file transfer is completed, if only to avoid forcing users to keep their bloodshot eyes glued to the screen throughout the process. Also, I don't see why an Apple CP/M file transfer program couldn't have been included, to avoid the DOS conversion process entirely. And, perhaps most important, there's got to be a better way of adding line feeds to ASCII files than using an ultra-slow BASIC program. Surely, such a program could be converted to machine language to run a lot faster, and avoid the delays that come up.

Considering the "user-friendly" nature

of the documentation, it's a wonder that the manufacturer didn't provide the ability to get out of the programs more gracefully. Except for the BASIC "Reform" program, I couldn't find a way to return to PC-DOS without resetting the computer and booting up from scratch. Obviously, this could be a serious hassle if you plan to use the program with a RAM disk. I later found out that an updated instruction card slipped into the manual informed the user that depressing the F1 and X keys allows exiting into DOS without any problem; unfortunately, this card appeared to have been waylaid between the time I purchased the program and brought it home. This sure points to the need for binding any last minute manual updates into the documentation itself, preferably on page 1, marked "BE SURE TO READ THIS BEFORE YOU MAKE A TOTAL JERK OUT OF YOURSELF."

All things considered, had I known the significant drawbacks of this program before I bought it, I might well have opted to use a standard CP/M data capture program instead. On the other hand, when puttering around with computers at 3 a.m., I like as many menus and user-friendly attributes as I can get, to avoid the inevitable mistakes that come up through sheer exhaustion. As long as you're extremely patient, or don't have to transfer the equivalent of a couple of novels, The Apple-IBM Connection does its job adequately, albeit much more slowly (at 300 baud) than I would like. And the good thing is, once they're transferred, they're done; you never have to worry about it again—at least, not until you buy a new computer. As for me, I think I may just keep the PC, until it crumbles to dust—if only to avoid ever having to go through file transferring again! —Marc Wellage

Editor's Note: At press-time, a company spokesman informed the author that the latest versions of The Apple-IBM Connection will be provided with improved documentation to note the modem switch settings. Also, the PC program will ultimately be updated to provide a machine language version of the PC Reform program; the Apple program will now support modem cards in either slot #2 or #3, and is now capable of using several new types of serial/modem boards including the CCS Card and Super Serial Card.

THE PC EXPERTS

PCX

SOFTWARE

READ-DOS \$50.00

At last there's a way to read files from PC DOS disks under CP/M 86.** A PCX exclusive.

EDITDISK \$50.00

Now it's easy to search out, check out and change any sector on a Winchester or floppy. EDITDISK displays contents in hexadecimal or ASCII. You'll be so glad you have it.

LOADFAST* \$40.00

Now large EXE program files load at least 50% faster or your money back. Enhance all your programs with this guaranteed money saver. The time you save will be well worth it.

LINKUP \$30.00

Link your PC to any CP/M** system and use it in either terminal or computer mode. Save money, space and time. Upload and download files at speeds up to 9600 baud.

HARDWARE SCALL

Call PCX for the best prices on Persyst and Quadram memory boards. Also CAMEO Winchester disk drives. Order on separate sheet.

Clip & mail today - put these PCX utilities and enhancements to work right away
☐ EDITDISK ☐ LOADFAST ☐ LINKUP ☐ CFACTRAK
☐ PCX products are available. *CP/M is a registered trademark of Digital Research. **IBM PC and PC-DOS are registered trademarks of IBM.

Name _____ Ph _____



Address _____

City _____

State _____ Zip _____

Q/Via _____ Exp _____

☐ Check enclosed ☐ Cal. res. add 6% No COOs

THE PC SOFTWARE EXPERTS

21941 Cayuga, Lake Forest, CA 92630

Order by phone: 714/951-8320

IBM PC+ PC-DOS 1.0 or 1.1 64k and disk required

*Software developers - resale licenses on these and other PCX products are available. **CP/M is a registered trademark of Digital Research. *IBM PC and PC-DOS are registered trademarks of IBM.

CIRCLE 341 ON READER SERVICE CARD

Product Information

A list with product information of some of the programs mentioned here.

PC, Apple, and TRS-80 programs that specifically permit complete data file transfer between systems (ASCII, binary, or both):

Apple-IBM Connection
 Alpha Software Corporation
 12 New England Executive Park
 Burlington, MA 01803
 (617) 229-2924

Price: \$195
 IBM PC & Apple II

Logon
 Ferox MicroSystems
 1701 N. Ft. Myer Drive, 6th floor
 Arlington, VA 22209
 (703) 841-0800

Price: \$150
 IBM PC/Apple II/TRS-80

Crossdoto
 GKE Software
 236 N. Santa Cruz Avenue
 Los Gatos, CA 95030
 (408) 354-5010

Price: \$99
 CP/M to PC-DOS or vice versa

Acculink
 IE Systems, Inc.
 112 Main Street
 Newmarket, NH 03857
 (603) 659-5891

Price: \$245
 IBM PC

Transfile
 Jack Strick & Associates
 949 S. Southlake Drive
 Hollywood, FL 33019
 (305) 925-7004

Price: \$199.95
 IBM PC/Apple II/TRS-80

Benchmark Telecommunications Program

Metasoft
 711 E. Cottonwood, Suite E
 Casa Grande, AZ 85222
 (602) 961-0003

Price: \$150
 IBM PC

File Transfer
 Personal Computer Products
 1400 Coleman Avenue, #C-18
 Santa Clara, CA 95050
 (408) 988-0164

Price: \$94.95
 TRS-80/IBM PC or
 Apple II/IBM PC

PC Transfer
 Solartek
 RD #1, P.O. Box 255A
 West Hurley, NY 12491
 (914) 679-5366
 IBM PC/TRS-80

UAP-LINK
 Unique Automation Products, Inc.
 15401 Redhill, Suite G
 Tustin, CA 92680
 (714) 730-1012

Price: \$250
 IBM PC

Xeno-Copy
 Vertex Systems
 7950 W. 4th Street
 Los Angeles, CA 90048
 (213) 338-0857

Price: \$99.50
 Transfers nearly every major micro-computer format (except Apple II) to PC-DOS

General PC and Apple communications packages that allow data file transfer between microcomputers:

Intellicom

Computer Toolbox, Inc.
1325 East Main Street
Waterbury, CT 06705
(203) 754-4197

Price: \$49.95
IBM PC

Micro-Link II

Digital Marketing Corp.
2670 Cherry Lane
Walnut Creek, CA 94596
(415) 938-2880

Price: \$89
IBM PC

Direct.Connect

Direct.Aid, Inc.
895-C South Broadway
Boulder, CO 80303
(303) 494-8265

Price: \$145
IBM PC

Micromodem Terminol Program

Hayes Microcomputer Products, Inc.
5923 Peachtree Industrial Blvd.
Norcross, GA 30092
(404) 449-8791

Price: \$99
IBM PC & Apple II

Centerm

Information Analysis Systems Corp.
Mason Road #2
West Willington, CT 06279
(203) 429-1691

Price: \$89.95
IBM PC

Asynchronous Comm. Support

IBM Corporation
P.O. Box 1325
Boca Raton, FL 33432
(800) 447-4770

Price: \$40
IBM PC

Crosstalk

Microstuff
1845 The Exchange, Suite #140
Atlanta, GA 30339
(404) 952-0267

Price: \$150
IBM PC & Apple II

Autotalk

Norell Data Systems Corp.
3400 Wilshire Blvd.
Los Angeles, CA 90010
(213) 257-2026

Price: \$79.95
IBM PC

Linkup

PCX
21941 Cayuga
Lake Forrest, CA 92630
(714) 951-8320

Price: \$30
IBM PC

Smorterm/PC

Persoft, Inc.
2740 Ski Lane
Madison, WI 53713
(608) 233-1000

Price: \$60 to \$150
IBM PC

Iceterm

Professional Software Assocs., Inc.
5353 Wayzata Blvd.
Minneapolis, MN 55416
(612) 929-7889

Price: \$89
IBM PC

Data Capture

Southeastern Software
7743 Briarwood Drive
New Orleans, LA 70127
(504) 246-8438

Price: \$65 to \$120
IBM PC & Apple II

ASCII Express and Z-Term

Southwestern Data Systems
10761-E Woodside Avenue
Santee, CA 92071
(619) 562-3670

Price: \$50 to \$140
Apple II

Interlyne

Starside Engineering
P.O. Box 18306
Rochester, NY 14618
(716) 461-1027

Price: \$149
IBM PC

VisiTerm

VisiCorp
2895 Zanker Road
San Jose, CA 95134
(408) 946-9000

Price: \$149
Apple II

Move-It

Woolf Software Systems
23842 Archwood Street
Canoga Park, CA 91307
(213) 703-8112

Price: \$150.00
IBM PC

With all the clamor about personal computers, a fundamental fact is often overlooked: some simply *work* better than others.

Consider the COMPAQ Portable.

A computer will make you more productive. A computer will make you more efficient. You hear it everywhere. But you don't hear about which computer actually works best.

A computer isn't magic. It's a tool. And just like other tools, some computers work better than others.

The COMPAQ[®] Portable is a combination of 20th-century electronics and 19th-century pragmatism. It simply does personal computing better. Here's why.

Works in more places

You don't do all your thinking in one place. Why have a computer that stays in one place?

The COMPAQ Portable has all the capabilities of a large desktop computer. But now those capabilities can go where you go.

You can move it from office to office to share its resources. You can move it into the conference room to answer questions when and where they come up.

With the COMPAQ Portable, you can be as productive in your hotel room or your lake house as in your own office. It's a reliable companion on a business trip. It's a powerful sales aid in your customer's office.

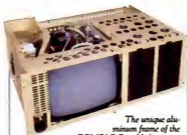
What's more productive than a computer? A computer that works for you in more places.

Works with the greatest number of programs

The most important consideration when you choose a computer is "what programs will it run?" And that's one more reason for choosing the COMPAQ Portable.

The COMPAQ Portable runs more programs

The COMPAQ Portable was designed to fit under a standard airline seat so you can take it on business trips.



The unique aluminum frame of the COMPAQ Portable has cross-members that strengthen it front-to-back, side-to-side, and top-to-bottom. It's a design practice commonly used in race cars.

than any other portable. In fact, it runs more than most non-portables. That's because it runs all the popular programs written for the IBM[®] Personal Computer. There are hundreds of them. They are available in computer stores all over the country, and they run without any modification, right off the shelf.

Imagine the power of a portable word processor. There are dozens of different word processing programs available for the COMPAQ Portable.

Planning, problem-solving, and "what-ifs" are a cinch with a variety of popular electronic spreadsheet programs. The COMPAQ Portable runs them all.

There are accounting programs for anything from computerizing your family budget to full-scale professional management of payables, receivables, inventory, and payroll for your company.

There are programs for making charts and programs for communicating with other computers. Or if you want something really specialized, there are even program languages for writing your own programs.

So, you get portability and you don't give

up problem-solving power. The combination adds up to the most useful personal computer on the market today.

Works better because it's easy to read

The display screen of the COMPAQ Portable measures nine inches diagonally. It shows a full "page width" of 80 characters on a line so tasks like word processing are easier. And those characters are big enough to read even if you're leaning back in your chair.

The display shows both high-resolution graphics and easy-to-read, upper- and lowercase characters. One screen



There are hundreds of useful programs for the COMPAQ Portable because it runs all the popular programs written for the IBM.

for all the information. With some personal computers, including the IBM, you can have either the graphics or the legible characters, but you can't have both unless you buy two different displays.

Incidentally, computer prices are often quoted without a display. The display of the COMPAQ Portable is built in, of course.

Add-on options make it work the way you work

Inside the COMPAQ Portable are three open slots. Electronic devices called expansion boards fit those slots and give the COMPAQ Portable new powers.



Just like the programs, expansion boards designed for the IBM work with the COMPAQ Portable, so there are dozens available right now. With them, you can make your personal computer more personal.

Want to check a stock price? Or look up something in The New York Times Information Service? One expansion board enables the COMPAQ Portable to handle those communications over ordinary phone lines.

Want to use your company's central computer files while you're on a trip? There are boards that allow the COMPAQ Portable to communicate with a variety of large mainframe computers.

Other boards let you hook up controllers for computer games or increase memory capacity. Still others let you connect personal computers in a network so several people in your office can share the same information.



Works better because it's tough enough for the road

Portable doesn't just mean smaller. Portable means tough, too.

The COMPAQ Portable was built to withstand the hard knocks of constant travel. An aluminum frame within the case completely surrounds the computer's working components. Each disk drive is mounted in rubber shock absorbers instead of being bolted directly to the frame.

To test internal components, the COMPAQ Portable was subjected to impacts of 40 G's while running a program. After impacts on each side, there was no internal damage and the program was still running. Without error.

Computers are for getting rid of worries, not giving you new ones.

Designed to help you work better, too

The COMPAQ Portable was designed to feel good.

Specifications

Software

- ☐ Runs all the popular programs written for the IBM PC

Memory

- ☐ 128K bytes RAM
- ☐ Expandable to 640K bytes

Storage

- ☐ One 320K-byte minifloppy disk drive, second drive optional

Display

- ☐ 9-inch (diagonal) monochrome screen
- ☐ 25 lines by 80 characters
- ☐ Upper- and lowercase, high-resolution text characters
- ☐ High-resolution graphics

Expansion board slots

- ☐ Three IBM PC-compatible slots

Interfaces

- ☐ Parallel printer interface
- ☐ RGB color monitor interface
- ☐ Composite video monitor interface
- ☐ TV RF modulator interface
- ☐ Communications interface optional

Physical specifications

- ☐ Totally self-contained and portable
- ☐ 20"W x 8 1/2"H x 16"D

The keyboard is detached so it can fit into your most comfortable working position.

The keyboard cable remains connected at all times. So you don't have to unpack it and hook it up every time you use your computer.

Because the display is built in, the COMPAQ Portable makes a neat,

small package on your desk, instead of a big obstacle you have to talk around. The built-in display also avoids the usual cable clutter because there's no need for separate cables for the display.

The COMPAQ Portable even has an electronically synthesized sound to create the familiar keyclick of a typewriter. With a simple keyboard command you can adjust the volume to suit the level of background noise in your office.

The added usefulness is free

The COMPAQ Portable can do what desktop computers do and do it in more places. But it doesn't cost any more than an ordinary desktop.

In fact, it costs hundreds less than a comparably equipped IBM or Apple® III. The COMPAQ Portable comes standard with one disk drive and 128K bytes of memory, both of which are usually extra-cost options. A second disk drive and additional memory are available to make your COMPAQ Portable even more powerful.

The bottom line is this—you just can't buy a more practical, useful, productive computer. Before you decide on a computer, you owe it to yourself to compare the COMPAQ Portable.

For the location of the Authorized Dealer nearest you, call 1-800-231-9966.

©1981 COMPAQ Computer Corporation
COMPAQ is a trademark of COMPAQ Computer Corporation.
IBM is a registered trademark of International Business Machines Corporation.
Apple is a registered trademark of Apple Computer Inc.



COMPAQ™

The most computer you can carry



Burned By Pirates?

PROLOKSM

SOFTWARE
PROTECTION
DISKETTE

Don't let unauthorized copiers put a match to your profits.

The PROLOK Software Protection System is powerful, low-cost insurance against piracy.

Tough To Break

Created by a special, patent pending manufacturing process, each PROLOK Diskette is unique.

The PROLOK Protection System provides multi-level security, rendering mass by-pass schemes such as bit or nibble copiers ineffective.

Easy To Use

PROLOK Protection is invisible to the legitimate user. Back-up with normal system utilities. Protected files may be transferred to and from hard disks.

Stop your profits from going up in smoke. Call, or send \$9.95 for your PROLOK Evaluation Diskette and start protecting your bottom line.

Vault Corporation
2649 Townsgate Road, Suite 500
Westlake, CA 91361
(805) 496-6602, ext. 222

California residents, please add 6% sales tax.

PROLOK, PROLOK Software Protection Systems, PROLOK Diskette and PROLOK Evaluation Diskette are trademarks of Vault Corporation.

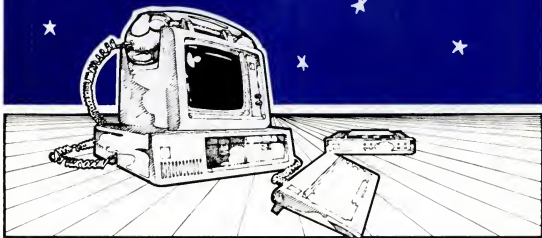
© 1983 Vault Corporation.

CIRCLE 306 ON READER SERVICE CARD

CIRCLE 308 ON READER SERVICE CARD

lighted

REACH OUT...



With AUTOMATED TELEMARKETING

Introducing the Personal Computer Automated Telemarketing system from Arlington Software+Systems.

Now even the smallest business can benefit from telemarketing without special telephone equipment or service. PCAT is a highly efficient system for managing and scheduling the phone calls that are so important to your success.

PCAT IS FLEXIBLE

- Telephone Sales
- Lead Qualification
- Customer Service
- Surveys
- Receivables Collection
- Inquiries
- Fund raising

PCAT IS EFFICIENT

- Stores customer or client information
- Schedules out-going calls by date and time
- Reschedules busy/no answer calls
- Automatic dialing of local, long distance and network calls
- Built in word processor for order confirmation, letters or memos
- Prompter scripts for consistently effective sales or service

PCAT IS COST EFFECTIVE

You'll be surprised just how cost effective PCAT can make your new or existing telemarketing operation. PCAT reduces your marketing costs, increases productivity and ensures that every contact can be followed up by callback, confirmation, or order entry.

PCAT IS EASY TO USE

In addition to automatic scheduling and dialing, PCAT uses function key prompts and help screens to guide you through the program. A comprehensive User's Guide is provided.

WHO NEEDS PCAT?

- Retailers
- Insurance Agents
- Stock, bond and commodity brokers
- Wholesalers and distributors
- Customer service or support depts.
- Real estate agents
- Accounts receivables depts.
- Collection agencies, etc.

HARDWARE REQUIREMENTS

IBM Personal Computer with 128k, at least one diskette drive, 80 column monochrome or color monitor, and a Hayes Smartmodem or Novation Smart-Cat. Printer is recommended.

PCAT[®] is a trademark of ARLINGTON Software+Systems. IBM is a trademark of International Business Machines. Hayes Smartmodem is a trademark of Hayes Microcomputer Products, Inc. Smart-Cat Modem is a trademark of Novation Inc. Arlington Software+Systems, 97 Bartlett Ave. Arlington, MA 02174 (617) 641-0290

CIRCLE 125 ON READER SERVICE CARD

- ☐ Have someone call me. I'm interested.
☐ Please send me written information.

NAME: _____

ADDRESS: _____

CITY: _____

STATE: _____ ZIP: _____

PHONE # () _____

ARLINGTON
Software+Systems
97 Bartlett Ave
Arlington, MA 02174
(617) 641-0290

IN THE FLAT WORLD OF NETWORKING THERE IS A COLUMBUS.



NOVELL.

We Know How You Felt, Columbus!

In 1492 most people were saying the world was flat. They said, "You'll fall off the edge if you go too far." But that didn't stop you Columbus. You went ahead and discovered America.

Today, most people are saying, "file service... is just not feasible." They're even saying, "operations like record locking are not available." But that hasn't stopped Novell, either. Because we've gone ahead and discovered, designed, yes... even built and shipped file servers that the less adventurous said couldn't be built. And our file servers are up and running all over America, (not to mention the rest of the world.)

Our Versatile Applied Server Technology (VAST) lets multiple operating systems on multiple types of personal computers share the same disk space and directories simultaneously.

And yes, all you other guys, record locking is available... on the ShareNet/VAST system, anyway.

Discover the vast ShareNet Difference.

The trouble with the "civilized" world of networking offered by our competitors is that they are still thinking FLAT! They're still concentrating on the hardware connection instead of the software that makes

that hardware function. Just like Columbus, Novell is the ONLY company that can offer you a VAST networking difference. We're thinking round, you see.

Does choosing a network have you "on edge"?

Don't fall off the edge! If networking—we mean real local area networking of numerous PC's, running multiple operating systems without modification to "off the shelf" software, having concurrent file sharing, default file locking, extensive data security and more—sounds exciting to you, call us for a demonstration so you can discover your options. ShareNet/VAST will take you out of the "flat" bounded network world and into the boundless universe of networks that work.

Explore Novell's world!

Discover the vast ShareNet difference. You'll find out-of-this-world performance at very down-to-earth prices. ShareNet/VAST is easy to use. All you have to do is call us and we'll set sail on a course that solves your PC networking problems. Get on board with the Columbus of networking. Novell, Inc., 1170 North Industrial Park Drive, Orem, Utah 84057, 801 226-8202 • 800 453-1267



NOVELL

**Novell—making networks work.
Our VAST difference.**

*3Com Corp. in March Systems & Software, pg. 118

**3Com Corp. in March Systems & Software, pg. 119

Famous Lost Words.

In December 1922, on a train from Paris to Lausanne, everything important Ernest Hemingway had written — except for pieces already in print plus two short stories — was lost forever in one brief moment.

The Moral Is: If You Respect It, Protect It.

In 1983, countless hours of precious writing will be lost to word processing programs that cannot save text from a system crash.

Only one word processing program can.
The FinalWord.

If the power to your personal computer surges or suddenly goes off, The FinalWord saves your text. When the power comes back, so does your immortal prose. Even text you delete can be recalled.

And there's more. Like split-screen editing, that lets you work with several documents at the same time.

Like true proportional spacing on all printers. And footnotes, indexes and table of contents — referenced, numbered and formatted automatically! Features that expand your creativity while increasing your efficiency.

PC Magazine calls The FinalWord, "one of the most powerful and versatile word processing programs available." And you can get it for most computers, including the IBM and Apple CP/M.

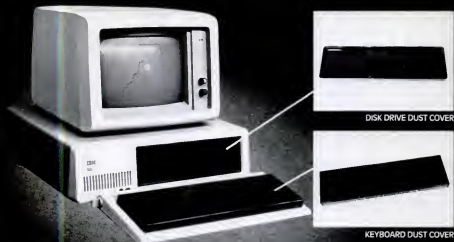
Call 617-576-2760
for more
information and a free brochure.

The FinalWord
All there is to say about word processing.



Mark of the Unicorn

222 Third Street, Cambridge, Massachusetts 02142



Protect Your PC!

Dirt, dust, and smoke can effect the successful operation of your IBM PC; even shorten its useful life.

Now you can protect your PC from these damaging airborne particles with our custom designed disk and keyboard dust covers.

CompuCable Corporation, a leader in the manufacture and distribution of computer products and accessories, has produced these handsome dust covers with you the PC owner in mind.

We know that you value your PC, so we've made both covers of high quality, smoke colored plastic that will protect your PC for years to come. We've also

engineered them to enhance the natural beauty of the IBM PC.

Best of all, this durable dust cover set can be yours at a surprisingly affordable price.

You depend on your PC to fulfill your information processing needs. Protect it!

For information on where to get the IBM PC dust cover set, call us at **800/222-2332**. In **California call 800/821-0684**, in Alaska and Hawaii call 714/635-7330. Dealer inquiries are welcomed.

 **COMPUCABLE CORPORATION**

Developing, manufacturing, and distributing quality computer products and accessories.

*Dust covers are manufactured by CompuCable Corporation.

© 1983, COMPUCABLE CORPORATION

CIRCLE 172 ON READER SERVICE CARD

New Exciting Arcade Action!

FOR YOUR IBM PC



The Exterminator

Test your skill and reflexes against the hordes of bugs infesting your castle. With spray gun ready, you exterminate the gnawing termites, army ants and deadly spiders.



Moon Bugs

Radioactive bugs are hatching within the moon's nuclear waste zones and are approaching to consume Earth's uranium deposits required to power your nuclear reactor. You must stop them with lead oxide projectiles while dodging falling nuclear debris and indestructible energy pulsars.



Styx

The bewitching, swirling STYX has laid siege on the vast expanse of your playing field. Aggressively, you venture into its territory to stake your claim. With every advance, your stronghold grows forcing the retreating STYX into the last remaining corner. You need determination, quick reflexes and innovative strategy to defy the mesmerizing symmetry of the STYX. Optional joystick or keyboard control.



And there's more!

Windmill Software products are written entirely in machine language to take maximum advantage of your PC's superior capabilities. Created originally for the IBM PC, we naturally include the features you're looking for — game pause, sound on/off, multi-levels of play and much more.

Requirements: Color graphics adapter, 64 K memory.

Price: \$39.95 each



Available at **ComputerLand** and other fine PC dealers or order direct. VISA, MasterCard or checks accepted. No extra charge for shipping and handling.

WINDMILL SOFTWARE INC. 2209 LEOMINSTER DR.,
BURLINGTON, ONTARIO, CANADA L7P 3W8 (416) 336-3353

CIRCLE 510 ON READER SERVICE CARD

A Great Software

FriendlyWare PC Introductory Set

VOTED THE 5TH MOST POPULAR IBM SOFTWARE ON THE MARKET IN SOFTALK MAGAZINE'S RECENT READER SURVEY.

MONEY magazine described the Intro Set as one of the two best learner programs available for microcomputers.

PC magazine said it "had to be seen to be appreciated".

According to SOFTALK, "the implementation and sophistication of the Introductory Set are superior to anything available in the public domain".

The Intro Set is a must for novice users, but it's a lot more than just a starter set. Even seasoned pros are finding things they like among the 4 demo programs, 17 games, and 8 utilities on the package.

Some are even saying that several individual programs on the set (such as the Personal Check Book on disk #3) are worth the price of the package all by themselves.

SUGGESTED RETAIL \$49.95

FriendlyWare PC Arcade

They told us that IBMers wouldn't buy games; but our customer feedback told us otherwise.

When the first two PC ARCADE production runs sold out before they shipped, we knew our customers were right.

PC ARCADE is a solid lineup of 10 fast-action arcade games for the IBM PC.

ASCII MAN, EAGLE LANDER, STAR FIGHTER TX-16, SHOOTER, BRICK BREAKER, GORILLA GORILLA, ROBOT WAR, BUG BLASTER, HOPPER and PC DERBY.

All 10 were written in Assembly language for speed and Text Mode for use on monochrome OR color monitor.

All games feature a PAUSE BUTTON and BOSS IS COMING KEY, and all but one of the games (EAGLE LANDER) can be controlled with EITHER a joystick or the keyboard.

And best of all, you can play them forever on five rolls of quarters.

SUGGESTED RETAIL \$49.95

FriendlyWriter (with FriendlySpeller)

Combine the best little letter writer you've ever learned to use in 10 minutes, with a fast and accurate spell checker that compares your letter with a 30,000+ word dictionary, and you've got one of the greatest things to happen to word processing since the INSERT and DELETE keys.

FriendlyWriter is designed specifically for the kind of word processing you need the most — the 1 to 6 page business or personal letter. And using FriendlyWriter is as easy as striking a key.

FriendlyWriter (with FriendlySpeller), the only word processor in the world with a 30,000+ word dictionary that sells for under \$100.

SUGGESTED RETAIL UNDER \$70.00.

B Great Prices

The days of the \$495.00 "Watzitdo" software package are over.

The same is true for \$39.95 one game packages.

Software pricing is coming down out of the clouds, and today's software consumers are proving once again that the old American business ethic of "producing a quality product at a fair price" still has merit.

At FriendlySoft, our objective has always been to give you the products you want, in a format that you can use and appreciate, at a price you can live with.

So far, your response is telling us that we're on the right track.

C THE BEST Great Support

No other software company in the world backs their products as completely and as simply as we do.

THE FRIENDLYWARE "NO FINE PRINT" LIFETIME GUARANTEE states:

"If your master diskette fails due to normal use, we will replace it, AT NO COST, within 48 hours of receipt of your original master.

If your master diskette fails due to abnormal use (staple in media, food on hub ring) we will replace the programming onto your diskette within 48 hours of receipt of your original master and a blank, unformatted, diskette.

We also offer a unique 24 hour hotline, where you get quick answers, instead of taped messages.

In short, FriendlySoft is the unchallenged leader in software product support. And we intend to stay there.

There are three good reasons why we're called "one of the fastest growing software companies in the business"



FRIENDLYSOFT, INC.

ARLINGTON, TEXAS

Producers of innovative, quality software products
EXCLUSIVELY for the IBM Personal Computer

CIRCLE 268 ON READER SERVICE CARD

FriendlySoft products are available at leading computer and software dealers worldwide.

UNBELIEVABLE!

XCOMP sat down to design a truly distributed IBM network so versatile and complete that it would satisfy any user's needs.

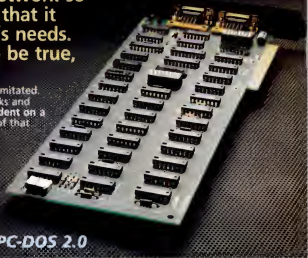
It seems too good to be true, but we did it!

X-NET is so advanced that it can only be imitated. It has all the features of standard networks and many more. And, because it is **not dependent on a central file server** you save the high cost of that hardware.

Call our sales department today for complete details on X-NET. The exclusive network of PC-DOS 2.0!

X-NET

A Network Superset of PC-DOS 2.0



Other quality products available from XCOMP.



CONTROLLERS

XCOMP manufactures a complete line of controllers for all popular drives. The X-R Series is a controller for 3 to 300 megabyte drives.

We also produce a 5100 controller package. A microprogrammable data board is common to each package and operates with a second drive interface board. Buffer size is 256 bytes, with disk data rate up to 10MHz.



HARD DISK SUB-SYSTEMS

10 megabyte and 16 megabyte hard disk sub-systems for the IBM PC, Apple II and III and nearly all popular personal computers.

XCOMP sub-systems are 2 to 3 times faster than many of the competition's and come complete with our extensive software.



PACKAGE DEALS

Exceptional prices on 10 and 16 megabyte formatted drives and controllers. The ST/S for \$100 computers and the ST/R for single board computers. An optional Z-80 adapter allows for simple plug-in convenience. Optional equipment includes software, cables and cabinetry.



THE TOASTER

THE TOASTER is a hard disk sub-system containing TWO REMOVABLE 3.5", 5 megabyte cartridges. THE TOASTER provides unlimited storage and convenient back-up with total portability. Speed and disk.

THANK YOU FOR YOUR OVERWHELMING RESPONSE!
We are substantially back-ordered on TOASTERS. We appreciate your patience!

*IBM, Apple II and Apple III are trademarks of International Business Machines Corporation.© 1983, XCOMP, Inc.

XCOMP, Inc., 7566 Trade Street, San Diego, CA 92121, (619) 271-8730, Telex 182786

CIRCLE 455 ON READER SERVICE CARD

We've scaled up the two world leaders for mail and shipping.



with PC WEIGHMATE™

Microcomputer Scale System.

A microcomputer add-on accessory from Micro General that makes the IBM-PC and Apple II computers manage mail, shipping and inventory counting efficiently—and for a lot less money.

A way to cut postage that carries a lot of weight.

The PC Weighmate computes postage rates for letters and parcels instantaneously, either by USPS, International, UPS or Federal Express. It does it with its unique disc software and with a super-accurate 25-lb. capacity electronic scale platform that easily plugs into an available slot.

"Rate Shopper"—Send It the best way—for the least.

Gone are complex rate charts and errors of adding more postage "just to be sure." The "Rate Shopper" feature displays the least expensive or quickest way of shipping a package to any zip/zone in the United States. And, as the rates change, so do the floppy discs. We update them whenever necessary.

Give your IBM-PC or Apple II "Scale-Power."

With PC Weighmate's amazing software. It offers business solutions superior to most available electronic scales that cost thousands of dol-

lars more. PC Weighmate has other uses too. Precision weighing and piece counting with resolution of 1 part in 50,000. PC Weighmate is attractively priced and can pay for itself in just months by eliminating postage errors and increasing productivity.

The system with a following.

Micro General, the largest supplier of postal computing scales to the U.S. Postal Service, is a leader in microcomputer scale technology. That's why we've scaled up the two world leaders in personal computers!

CIRCLE 527 ON READER SERVICE CARD

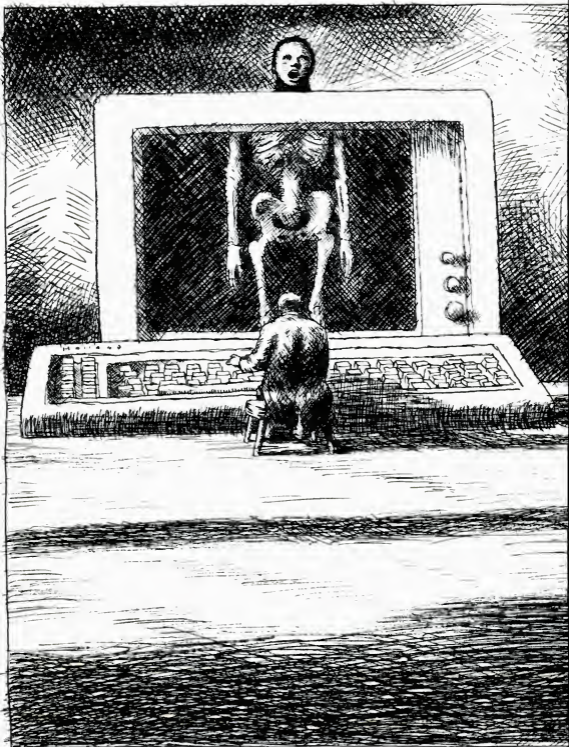
For additional data or dealership information, call toll-free (800) 482-3184 or write to:

MICRO GENERAL CORPORATION
1929 S.E. Main Street
Irvine, California 92714
(714) 557-3744

MICRO GENERAL
CORPORATION

Apple and IBM are trademarks of Apple Computer, Inc. and International Business Machines Corp., respectively

See us at
COMDEX
Fall '83
Booth 488



IBM may employ the ghost of Charlie Chaplin for its ad campaigns, but the manufacturer is less than comfortable with ties to modern-day Hollywood.

Why The Good Guys Don't Use PCs

Where in the world can you find bad guys who use black computers that look suspiciously like IBM mainframes, good guys who use kludged-together spare parts, and nobody who uses the IBM PC? Where else but Hollywood?

A kid computer backer nearly blows up the world with his ancient IMSAI machine in the movie hit *WarGames*. The new TV season brings us a CBS series called "Whiz Kids." It's not a nostalgic sitcom about the 1950 Philadelphia Phillies and Robin Roberts, but an adventure show starring a band of suburban high-schoolers who solve mysteries with the help of a talking home-brew computer named Ralf.

Terminal Wizardry

In another era, the show might have been called "The Hardy Boys Get a Computer." The pilot program I screened included the obligatory dog-digs-up-a-human-skeleton scene as well as the clas-

sic late-at-night-in-the-cemetery segment. But there was also stuff the Hardys could only have dreamed of doing.

Peering through thick-rimmed glasses that make him look like a young Clark Kent, Richie Adler (played by Matthew Laborteaux) can perform magic with just about any terminal he sits before. In the pilot show I saw, he taps into a real estate title company's database using a classroom Apple III and gets his beloved Ralf first to page him through the school's main computer and then search through the county's database of vital statistics. During that laborious search—in the show's best sight gag—Ralf's robot arm feeds Richie a sandwich.

Fortunately, Ralf is not some cuddly machine ready to be marketed as a cute plush-talking doll ("En-ter yo-wer pass-word puh-leeze."). He turns out to be little more than a mostly unseen box with the usual peripherals, plus some video-digitizing equipment and that robot arm.

Unauthorized Entry

Still, all that "unauthorized entry" made me a little uneasy. I had grim visions of kids across the country clamoring to get Deed to buy them fancy computers, giving their machines cute names like "Fido," and using them to siphon money from their teachers' meager bank accounts to their own. I'd also heard rumors that IBM PCs would play a supporting role in the show and wondered why they were missing from the pilot. The closing credits thank everybody from Atari to Xerox, but Big Blue is conspicuous by its absence. Passing through Los Angeles, I called on the "Whiz Kids" executive producer and co-creator, Phil DeGuere, in his office on the lot of Universal Studios to find out more.

The office is not on the standard Universal Studios tour, but maybe it should be. Out in the waiting room, I detected the dulcet clatter of a NEC Spinwriter, muffled under a sound-reducing hood. I was ushered into the inner sanctum where I found DeGuere, who resembles a jovial beard, busy downloading a script at 300 baud to his COMPAL computer.

God and the Apple

It turns out that DeGuere, who also created the "Simon and Simon" series, has been a bit of a hacker himself. When his wife bought him an Apple a few Christmases back, he "thought God lived inside the machine." Like most of us, he quickly learned otherwise and incidentally discovered the connection between computers and kids.

"I found myself going to the computer store, and I'd go to ask a perfectly logical question, and the guy who owned the computer store would say, 'Well, I don't know.' And I would say, 'Wait a minute, you sold me this machine. It's \$2,000 worth of equipment. You don't know?' And he'd say, 'No, I don't know.' I'd say, 'Is there a book where I can read about it?' and he'd say, 'I don't know; maybe you can call Apple'—which I did. And they said, 'I don't know.' And it finally came down to the fact that the kids hanging out in the computer store were the only ones who had the answers."

During an actors' strike, DeGuere spent 6 straight days writing a "very simple database manager that just handled the ingredients in a recipe. By the time I finished

debugging it, the last thing in the world I wanted to do was use it."

Ferrari-writers

The experience didn't faze him. "When I went back to work after the strike, I had a huge workload. It suddenly hit me: I've got to get a word processor. I woke up one morning and it was like new-car fever. I had to have one right away."

Like most writers who've made the switch to word processing, DeGuere is ecstatic about it. "An IBM Selectric II is a Volkswagen," he puts it in a metaphor that reinforces everything we've always believed about Californians and cars. "A word processor is a Ferrari."

He doesn't run COMPAL's word processor on his current system, because

AN IBM
*Selectric II is a
Volkswagen. A word
processor is a Ferrari.*

"when you're working on it, it doesn't look the way it looks when you print." Instead, he uses the CP/M version of WordStor, along with a program called Scriptor, which takes a WordStor file and turns it into a finished script in the peculiar format the film and television industries require.

Power Up!

That system's about to be replaced. "We're moving to a local network with a large hard disk, a hard-wired local area network here, and short-haul modems connecting other buildings around the studio at 9600 baud, and a big virtual disk—about a megabyte and a half. The manufacturer is Action Computer Enterprises (ACE) and the computer is called an S-100 machine. We're going to use Wyse 8-color terminals and keyboards customized for WordStor."

The whole thing will have a backup power supply. As DeGuere puts it, "When we power the system up, I hope we'll never turn it off." With good reason. "WordStor, Scriptor, dBase II, a dictionary, a thesaurus, and any other program that we

require will all be loaded into the virtual disk and stay there. Then each user can open files that can be accessed only by him until he is ready to release them. That way the writers don't feel like somebody's looking over their shoulder all the time. When the files are released and become open, all the rest of us can read them."

"There will be a fairly sophisticated printer buffer so that there is no downtime. We'll probably have at least three or four printers, two tractor feeds for scripts, one printer for letterheads, and one dot matrix for real fast stuff. I sincerely hope our electronic mail function will be a real timesaver. We will be able to read material on the screen, then send memos to each other instead of getting together for meetings, thus eliminating an incredible waste of time. We'll have a floppy backup system, probably somebody in the office to maintain that and make the backups. And then the present hardware that we're using will be shipped to the writers' homes and the secretaries."

About the Whizzes

DeGuere obviously knows a few things about computers. I asked him about the series.

"The kids are high school students, and they have a rather keen curiosity about things. They have formed an association with a newspaperman who's in his late 30s and whose understanding of computers is probably limited to his use of a word processor in his office. If they saw something really weird, they might go to the reporter and say, 'Farley, I think that guy's a spy for the Russians.' On the other hand, Farley's just as likely to come to Richie and say, 'I've got this license plate, and I've got three letters and one number, and the DMV won't run it for me, but I got them to give me the access code. Would you try it and figure out a way to do it?'"

"We're kind of tripping lightly over the question right now of unauthorized access into other computer systems, which has created a bit of a flap."

Paranoia Cherished

Access—the very subject that had piqued my curiosity! DeGuere elaborated: "I think I have a gut feeling for what is right and what is wrong when it comes to the issue of accessing other computer systems without authorization. For instance, I don't presume that there is a great deal of

The UCSD p-System. With Speed.

NCI



The new NCI implementation of the p-System. For IBM personal computers and compatibles.

NCI now makes the UCSD p-System run 1½ to 5 times faster on the IBM Personal Computer, including the new XT model and compatibles like Corona, Columbia, Compaq, Colby, Dot, Hyperion and Victor 9000. This speed is possible only with our new interpreter.

NCI includes more features for your PC.

NCI offers a wide range of software and hardware support that lets you tailor the p-System to your needs, including:

☐ **HARD DISK SUPPORT** compatible with most hard disk suppliers, including IBM Personal Computer XT, Corona, Davong, Corvus-Systems

and Tallgrass Technologies.

☐ **AUTOMATIC RAMDISK SUPPORT** (up to 512 K) stores files for much faster access.

☐ **PRINT BUFFER** (up to 64K) eliminates printing bottlenecks.

☐ **8087 SUPPORT** speeds numeric and graphics applications.

☐ **GRAPHICS SUPPORT** with much faster Turtlegraphics software or Tektronix emulation for business and scientific applications.

☐ **COMMUNICATIONS SUPPORT LIBRARY** links computers across continents.

☐ **NCI CUSTOMER SERVICE** - we're there when you need us to support the most reliable p-System ever developed for the IBM PC.

For all the advantages of the NCI version **PC** of the UCSD p-System call or write:

Network Consulting Inc.

Discovery Park, Suite 110 - 3700 Gilmore Way
Burnaby, B.C., Canada V5G 4M1. (604) 430-3466

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____

ZIP _____



NCI

Portability. Reliability. Speed.



**Now, get a complete
communications package
in just one package.**

Introducing PC Express.™

Until now, if you wanted a complete communications package for an IBM™ PC, you really had to go overboard. One board for sync and another for async communications. One for a modem. Yet another for electronic mail. You might end up filling all the expansion slots and still not fill your needs.

Now, you can get it all together with just one board—the new PC Express.

PC Express is a dynamic, interactive and powerful combination of sync, async and voice communications. It comes ready-to-use with software on diskettes, tutorials, and a pc board that easily plugs into an IBM PC or IBM-compatible computer.

It gives you complete PC-to-PC and PC-to-mainframe communications, including access to information networks such as The Source™, Western Union, Dow Jones News/Retrieval® and more. It puts at your command a fully integrated telephone management system with an unlimited telephone directory, full-screen text editor, auto-answering, auto-dialing from a data base, busy/ring/voice detection, on-board modem, electronic mail and more. For people who deal with people and information—brokers, marketing and sales professionals, managers—PC Express will eliminate the time you waste looking for data and make you more effective and productive than ever before.

PC Express enables your IBM PC to communicate with mainframe computers and perform DEC™ VT100/52 emulation. For added versatility, PC Express is also available with SNA, allowing your IBM PC to emulate a 3274 Cluster Controller, 327X and 3770 RJE terminals. For MIS Managers, that means you now have an effective way to reduce host processing and storage loads. And, for the first time, enjoy the productive possibilities of combining the problem solving powers of micro and mainframe software.

For details and your nearest dealer, call (415) 328-2411. Why waste time and money on boards that only offer piecemeal solutions, when PC Express can fill all your communications needs without filling your IBM PC.



Intelligent Technologies International Corporation
151 University Avenue, Palo Alto, CA 94301 (415) 328-2411

Specifications

Sync and async communications with IBM mainframes, and async with DEC mainframes, PCs, and information networks:
The Source, Western Union, Dow Jones News/Retrieval, etc.

Modems: onboard 300 baud, external up to 19.2K baud

External connectors:
RS-232C, standard RJ11 phone jacks

Telephone management capabilities:

Data base telephone and address directory
Full-screen text editor
Touch tone and pulse generation line access

Auto-connect for voice

Auto-dial

Busy/ring/voice detection on outgoing calls

Auto-speaker control

Call history file

Voice/data switching on same call

Interrupt priority selection

Port address selection

Electronic mail with message text editor and 10-page buffer capacity

Programmable user-defined functions

Optional: SNA (327X and 3770 remote job entry emulation.)



Instant one-button color printing.



Press here.

It's just that easy! Any time you want to print what's on your Apple's screen just hit the copy button on your Transtar 315 color printer with our PICS card installed, and it's done! No special programming, no lengthy code sequences, no need to exit your program! Just press the button and it prints!

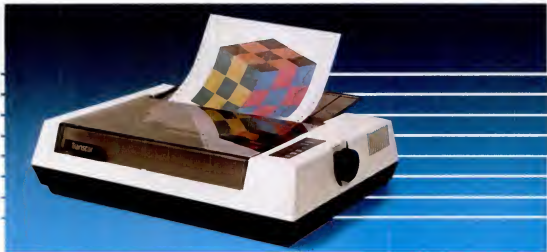
By adding the optional PICS card to your \$599 Transtar 315 color printer, you've opened up a whole new world of easy color printing. For the first time ever, our PICS parallel interface card enables you to screen dump virtually any program — graphics, charts, games — even copy-protected software! Specially designed only for the Apple II, II+, IIa, and Franklin computers, the Transtar 315 PICS card does the work of a parallel card and a lot more and costs only \$119.95.

At the push of a button, Transtar's innovative new 4-color diagonal ribbon will print up to 7 colors and more than 30 shades in a single pass.

The 315 is precision-built to exacting standards by Seikosha, the most experienced company of the famous Seiko group—recognized worldwide for quality and dependability. In fact, one of the nicest things about Transtar's 6-month warranty on parts and labor is that you'll probably never use it!

Innovative, inexpensive, dependable, easy: the Transtar 315. Color printing has never looked so good!

Only \$599.



*PICS cards are currently available for Apples and Franklins.
PICS cards for other computers will be available in the future.

Transtar
A Vivitar Computer Product

P.O. Box C-96975, Bellevue, WA 98009

CIRCLE 994 ON READER SERVICE CARD

privacy in the world. I don't go around thinking that unauthorized people can't get my driving record or things like that. So the idea of somebody flipping through the DMV files looking for some information that might pertain to me doesn't bother me. I kind of assume it's happening anyway. I tend to sort of cherish paranoia theories.

"I believe that the existence of computer networks and vast databases suggests that some things that we've taken for granted shouldn't be taken for granted anymore, that we're on shifting ground in society right now, and that it's probably a good thing that there are hackers who are cracking these systems, even though what any one hacker does may or may not be defensible.

"I don't think any hacker who gets into a computer system and crashes the files and renders it inoperable is doing something that should be commended. I'm not sure that a hacker who cracks a system because it's a challenge, and having done so and having learned more about the architecture of CPUs or operating systems or codes or stuff like that without doing anything harmful, is really a person to be scorned or frowned upon. I'm not sure about any of these things. I do know on a case-by-case basis how I feel."

Unethical Manipulation

What kinds of cases?

"I felt that the kid in *WorGomes* who changed an F to a C was bad. I didn't like it. I thought it was simple, simplistic, and unethical manipulation of an immature audience. If it had been a D or C, and he had changed a C to a B because if he didn't get a B, his mom wouldn't give him a hundred dollars to buy a new board for his machine, I would have bought that, and I think the kids would have cheered just as easily. But if you're flunking a class, you're going to have to take that course over again. This kid just deprived himself of the whole body of knowledge that whole course represented.

"In my show, Richie accesses the newspaper's computer, and the reporter says, 'Richie, I told you not to do that.' And Richie says, 'But you told me to call,' and the reporter says, 'On the telephone, Richie.' Another time he accesses a computer system, and he gets caught by his teacher, who calls him forward in front of the class, and—although we didn't shoot

the scene, because it would've been boring—clearly is going to reprimand him in front of the class and say, 'This is not what you're supposed to do.' Those things don't bother me. They didn't bother me when we were making the pilot, and they don't bother me now.

Learning Experiences

"The issue of whether it's good, bad, or indifferent is really something I'm not sure about. In terms of knowing what's right and what's wrong and what's good and what's bad, I think we're going through a transitional period where maybe a series about these kids, and others who are doing things they aren't supposed to do, is probably a good learning experience for everybody."

Really? How would DeGuere enjoy the learning experience if a kid got illegal access to his super-duper new system and walked off with the shows?

"It wouldn't bother me in the slightest. *Matthew Laborteaux* and *Melanie Goffin* (front), and *Todd Parter*, *Jeffrey Jacquet*, and *Andrea Elson* (rear) star in "Whiz Kids."

est," he replied without hesitation. "If a kid came in and crashed our files—even then I wouldn't be that mad. Because I've got to back them up. I mean, if I don't have backups, it's my fault. I don't expect people to go around just respecting these things per se. People come in here and steal equipment from time to time. I don't like it, but it doesn't outrage me. I feel if we can catch them, they should be caught, and if punishment is appropriate, they should be punished. If I were going to portray it, I would portray it that way."

Glass Houses

What if the studio gained access to his financial records around contract negotiation time?

"I don't presume privacy. Maybe I'm weird. First of all, I am convinced that this office is bugged, that the phone line is tapped, and that somebody is watching. I live in a house that's glass—I mean, it's literally 90 percent glass—and I do



assume that there is very possibly somebody watching me walk around naked in my house. And if that's what they want to do, fine. It doesn't bother me. I know that they can't sneak up on me without my seeing them. This is a weird world we live in. If I wanted privacy, I'd go someplace that I knew was really private. As it is, I just assume that somebody's listening.

PEOPLE WHO
are familiar with
computers will recognize
that certain things on
the show are "patently
impossible."

"We—the staff of the show, the studio, and the network—have been considering these questions a lot lately. As of right now, it appears that we have a consensus."

DeGuere dug up a sheet of paper from his cluttered desk and read a semi-official statement on the subject. "The creators and producers of 'Whiz Kids' are fully aware of the responsibility to present our stories in a manner that fosters among young people a clear understanding of their obligations to obey laws. If there is any instance in which any of the young protagonists use computer access in a manner of questionable legality, this fact will be made apparent, it will not appear that the act is condoned, and they will be suitably and quickly reprimanded." So far, that's our position.

"I, frankly, am beginning to think, from seeing the scripts develop, that we may have come up with some much better ways of telling our stories without the necessity for illegally accessing other computer systems. But I think it will happen from time to time, and I think that when it does, it will be handled in a very responsible manner and one that deals with it accurately."

Accuracy and Excitement

I wasn't entirely convinced. How accurate does the show plan to be? "The object

of the show is not necessarily to be accurate, but to feel accurate." People who are familiar with computers will recognize that certain things on the show are "patently impossible," DeGuere admitted, but the scenes in question will still "feel right even to people who know they're wrong," he added. And to people who are not familiar with computers, it will really look like they're getting a glimpse into the way computers and hackers function."

DeGuere pointed out that it's not easy to make computers exciting on the screen. "What happens when a person sits at a computer terminal is a pretty interior thing. To try and dramatize it and make it appear active and bring the audience into it in a way that is meaningful and also accurate, or relatively accurate, has been quite a challenge."

"The show has been designed to do the same thing for computers that ET did for extraterrestrials, which is to stop making people hate them and think that they're monsters and to see that they're really lovable and cute, and just really sort of stupid. They only do what you tell 'em to do. They just do it very quickly. And I believe for those people who are somewhat intimidated by the machines, that's exactly the effect the show's going to have, whereas people who are familiar with computers seem to enjoy it simply because it sort of explores all those possibilities you wondered about."

The PC Mystery

Speaking of possibilities, what about the PC? What's its role in the show?

"We don't have any contact with the IBM PC at all," DeGuere informed me.

Ripping up three full pages of questions about such things as DOS and video sync and all the nifty color graphics boards and monitors the show might be using, I squeaked, "Why not?"

"We're not in the business of buying the props that we use in the show," DeGuere answered. "All of the props, whether they be working computers or shells, are loaned to us by the companies. We debated seriously about the PC and the Apple, and the reason we didn't choose the PC was a conversation I had with IBM."

"I submitted the pilot script to them, and I said, 'We are looking for certain kinds of support, primarily the loan of some equipment on the one hand, and

possibly some insight into your R and D and stuff like that.' We're working on about a 4- or 5-month lag, and the things I photograph today should still be hot 5 months from now."

"IBM said, 'We never expose any new product until it's ready for market—it's an absolutely firm corporate procedure—because we have found that any time there is a situation in which an IBM product is shown in such a way that a customer of ours can see it doing something, they're going to call up and want it.' IBM doesn't leak anything."

I nodded sympathetically. IBM wouldn't offer a sneak preview of a new system to defuse enemy nuclear warheads even if they were about to fall on Boca Raton.

He Saw It Fly

DeGuere continued: "I said, 'Okay, I understand that. Read the script and let me know.' So a woman called me back, and she said, 'We like the script. We will give you permission to use IBM equipment and display the IBM logo, which we have never given anybody in a fiction film since before 2001.' Corporately, IBM was very unhappy at the way the computer, Hal, was portrayed, and it was so angry about it that it didn't want to have anything to do with movies."

"She said, 'The only thing we insist on is that you not show our equipment being used to access another system without

IBM WOULDN'T
offer a sneak preview of
a new system to defuse
enemy nuclear warheads
even if they were about
to fall on Boca Raton.

authorization, and that you not show the equipment doing something that it does not actually do, so we do not have the problem of a customer calling up and saying he saw it fly. Now, you wanted us to loan you some equipment, right? Are you a nonprofit organization? To which the

If you've invested in the IBM PC-XT or an IBM expansion chassis, chances are you're doing important things. Office work. Lots of writing. Managing a portfolio.

Nice going.

Now: May we suggest that you think ahead to the unthinkable: total wipe-out. Your hard disk may never crash and destroy all your files. But it can.

That's why we invented The Sysgen Image.

It lets you back up all your data—your entire hard disk—in about five minutes a day. On a handy little tape cassette. It's insurance against the unlikely event that your hard disk will lose what you've stored on it.

Just stop and ponder a moment about what would happen to your operation if you somehow lost all the data, letters, invoices, and phone numbers on your XT's hard disk.

At \$995, we think you'll agree that the



Sysgen Image is very inexpensive insurance.

Stop by any smart IBM PC dealer for a demo. Bring this ad; if he hasn't got a Sysgen Image in stock yet, have him call us.

Included with your Sysgen Image is a free data cassette loaded with industry-accepted applications software. It has been protected by Softlink's™ SoftLok™ encryption. If you decide you want to buy any of the programs you preview, you can get the unlocking code from your dealer.

Sysgen: the company that provides backup for your IBM PC, with or without hard disk. (Our Sysgen II 10- or 20-Mbyte hard disk systems, with built-in streaming tape backup, start at \$2995.) 47853 Warm Springs Blvd., Fremont, CA 94539. Telex: 4990843. Phone 800-538-8157, Ext. 970. In California, call 800-672-3470, Ext. 970.

SYSGEN
INCORPORATED
CIRCLE 672 ON READER SERVICE CARD



**THE BEST INSURANCE
FOR YOUR \$4995 IBM PC-XT:
A \$995 SYSGEN IMAGE.**

response had to be 'Well, we're not supposed to be.'

"I said, 'No, this is not a nonprofit organization. This is a very greedy capitalistic organization.'

"She said, 'Well, then, it's impossible. We simply can't loan you anything. If you were a nonprofit organization we would loan you—give you—anything you wanted, but if you're a for-profit organization, we can't.'"

IBM: Worried

"I said, 'Gee, I don't understand. Why? It seems to me that it would be a wonderful opportunity for you to expand your market base.'

"She said, 'Let me tell you something. In the year the IBM PC was introduced, it went from a market share of zero to 28 percent. You have to understand something about IBM. First of all, IBM salesmen will never call on you unless you ask them to. And if an IBM salesman walks in and sees another system by Burroughs or DEC or Xerox or whatever, he will not comment on that system. He will not say our system is better or our system does different things. If you ask him to evaluate the IBM system in comparison to the other system, he won't do it. All he will do is tell you what the IBM will do, what it costs, when you can get it, and things like that.'

"I was wondering what she was getting at. She said, 'Now, you've got to realize that the PC captured 28 percent of the market share in the year that it was intro-

We're worried about Xerox going out of business.

'Just think for yourself. Now, in one year, IBM took 28 percent of the market. What do you think would happen if a company like Radio Shack or Apple folded?'

"I said, 'Government. Antitrust.'

"She said, 'Right. You get the picture.'

"I said, 'Yes, I understand. I won't call you up again and ask you to loan equipment to me.'

The Bad Computer

But PCs have put in cameo appearances nonetheless. "We did use a lot of IBM stuff in making the show, but we either paid for it, or borrowed it from the data processing department. There are two big IBM systems here, and the guys are all tickled to get involved. It's very funny, because they've been working on the fringes of the movie business doing things like charting profits of films and stuff like that, but nobody ever came to them and said 'Guys, let's do some stuff here.' They've had a lot of fun and so have we, and they've been a great help to us.

"We used this intense IBM terminal with a beautiful display—a big four-color terminal. The EDP guys used a program called Roscoe to generate screens for us. That was the one that we were able to get close enough on—photograph sharply enough—to read it on a television set. I have to say I was really impressed with the quality of it in comparison to anything else.

"We also used a Xerox 1100, which is a \$50,000 stand-alone unit. It's a dynamite machine. It's the one that all the development was done on that was ripped off for the Lisa and used for the Star, with all the overlays and all the icons and all that.

"We actually ended up disguising the IBM. The story pits the kids against a bad corporation called NASCorp—which stands for Nasty Corporation—and they all had to have black computers. I got this idea because I saw a TICOOM—a black computer from England.

"So every NASCorp computer terminal is black. The Grid was a NASCorp computer, because it's black. But the IBMs weren't black, so we had to go and wrap them all in black contact paper. In so doing we obliterated the IBM logo, even

though, in truth, I don't think we had them doing anything that was not technically feasible for those terminals. So IBM unwittingly became the bad computer."

Tap, Tap, Tapping

From what I've seen and heard, "Whiz Kids" appears to be the good guys versus the bad guys—television as usual, with the computers more or less incidental frippery. If toasters were the hot technology,

IBM UNWITTINGLY became the bad computer.

we'd probably see a show about kids who solved mysteries by taking fingerprints off the chrome and divining information from English muffin crumbs.

That's a shame, because there are dozens of stories inside a machine such as the PC. How about a show where the sleuth solves users' mysteries? Peter Cunningham, known as PC to his clients, sneaks into the Boca Raton factory and uncovers all the interoffice memos on the bugs in PC BASIC. PC bears tell of a boy genius who can hook up the monochrome display to a graphics card—and searches the Himalayas to bring him back alive. PC helps a computer dealer who is kidnapped by a ring of competitors—for actually giving honest advice and decent service. The possibilities are endless.

A friend of mine posits the psychological theory that kids do whatever their parents find most irritating. Thus, in recent years, kids have taken to driving the rest of the world to distraction by barking "Nannanano," imitating a supernatural "greaser," talking in nasal Valspeak, and racing their cars like the maniacal Dukes of Hazard.

So if CBS has guessed right, we can expect millions of fine upstanding American youngsters to buy slews of modems, dial remote systems, and tie up the phone system by attempting unauthorized entry into computers of all shapes and sizes. In a way Shirley Temple could never have imagined, the "Whiz Kids" will tap their way into our hearts. /PC

THE IBMS
*weren't black, so we
had to go and wrap
them all in black
contact paper.*

duced. Now, we at IBM are very worried about companies like Radio Shack and Xerox.' At that time, the rumor was all over the industry that Xerox was in big trouble.

"I said, 'Xerox is going to be well represented in this show. If you're worried about Xerox getting more of the pie...' She said, 'No, you don't understand.

A Match Made To Win...

Introducing Thoroughbred™ Software
on the IBM® PC/XT



At last! Business and system software for the IBM PC/XT designed for results. Thoroughbred Software from SMC Software Systems brings the power and speed of mainframe software to the XT.

What makes Thoroughbred unique? Completely integrated business applications enhanced by Thoroughbred IDOL®, the leader in application development software. Specialized applications are simplified by IDOL's powerful customization features. Complementing the Thoroughbred business software line are SMC's well known Business BASIC programming language and a new word processing package.

SMC answers the multi-user need with a fast and efficient operating system, Thoroughbred/OS, which can handle up to four users simultaneously. And, of course, Thoroughbred is offered under MS™-DOS.

Available on 30 additional microcomputers, Thoroughbred Software has a proven track record for success. So put Thoroughbred Software on your XT and let a winning team fulfill all your business computing needs.



Run with the best...



Thoroughbred™
SOFTWARE



SMC Software Systems

A Division of Science Management Corporation

1011 Route 22, Bridgewater, NJ 08807

In New Jersey (201) 685-9000 • 800-526-3968

Thoroughbred Software and IDOL are trademarks of Science Management Corporation.
IBM is a registered trademark of International Business Machines Corporation.
MS-DOS is a trademark of Microsoft Corporation.

CIRCLE 715 ON READER SERVICE CARD

Think About The Rewards Of Being A Better Manager.



Management Diagnostic Series

To identify and pinpoint your management problems.

- Personal Management Skills
- Organizational Effectiveness
- Personal Interaction Styles

Thoughtware's Management Diagnostic and Training Series is an incredible new tool that can help you to see and understand how to become a better manager. And better management will improve the operating results of your business.

The educational, economic and operational benefits of Thoughtware's computer-based Learning Programs are enormous.

Educationally, Thoughtware is self-paced and continuously interactive. Real situations are simulated. The animation and color graphics motivate and hold your interest. Skills are practiced until they're mastered. There's consistent quality of instruction and increased training effectiveness. And even the capability to test yourself.

Economically, Thoughtware reduces training time and cuts the cost of training dramatically. And the more it is used by you and those who work with you, the more cost-effective it becomes. It also eliminates travel, living and instructor costs.

Operationally, training fits the schedule of the student, not the trainer, thus facilitating increased usage. There's minimal job interruption as training can take place on or off site, during or after regular hours.

But the real benefits of Thoughtware lie in what they can do for your business: Improve productivity, decrease costs, reduce turnover, improve customer satisfaction and sharpen your competitive edge.

Improve Your Management Skills And Solve Your Management Problems With Thoughtware.

A New And Unique Series Of Exciting, Personal Computer-Based Learning Programs.

Management Training Series
To help you become a better manager.

- Leading Effectively
- Motivating To Achieve Results
- Defining Goals And Objectives
- Improving Employee Performance
- Managing Time Effectively
- Conducting Successful Meetings.



Why We're Willing To Give You A \$350 Program For \$75.

To introduce you to Thoughtware, we'll send you one of our Management Diagnostic programs, Assessing Personal Management Skills (which normally sells for \$350), for only \$75. Using this program, you can pinpoint and understand your own strengths and weaknesses as a manager. We're convinced that once you see and experience the positive results of this program, you'll invest in additional Thoughtware training programs.

® Thoughtware is a registered trademark of the Institute for Management Improvement

To take advantage of this offer please send a check or money order for \$75 and indicate brand name and model of your personal computer.
Offer expires December 31, 1983.

If you're interested in becoming an authorized distributor, write to us.

Thoughtware Inc. Suite B
2699 South Bayshore Drive
Coconut Grove, Fla. 33133



Expanding The Universe Of Learning.

TANDON Blow Out!

Tandon
TM-55-2
..... **\$229⁰⁰**

Tandon
TM-100-2
..... **\$229⁰⁰**

(Please Limit 4 Drives Per Order)



"THE COMPUTER-LINE"

Product Information & Order Lines:

California

1-800-255-4659 / 1-213-716-1812

Colorado

1-800-525-7877 / 1-303-279-2848

Open 7 Days A Week

Mon.-Fri. 7 am to 8 pm / Sat.-Sun. 8 am to 6 pm

CIRCLE 262 ON READER SERVICE CARD

IBM Micro Security



**PC
Lock II**

XT "Wipeout" Protection

DiskLocker • Data Encryption
Unit Locking • Software Protection

MPPI, Ltd., 1126 Adirondack, Northbrook, IL 60062
Telephone 312/480-9730

IBM is a registered trademark of IBM Corp.

CIRCLE 336 ON READER SERVICE CARD

**FREE
OFFER**
BACKGAMMON
ONLY \$39.95

- Challenge the computer to an exciting game of backgammon, whether beginner or advanced.
- Several levels of difficulty
- Full backgammon board displayed on 80 column monochrome or color display.
- Buy single player version and get **BACKGAM 2™** 2-player version **FREE!**
- Easy to read instruction manual included.

For IBM PC or COMPAQ, requires DOS, 54K, 80 column display.

SEARS ELECTRONICS INC.



Tirrell Hill, Goffstown, NH 03045 (603) 497-3074



Please send **BACKGAM 1™** (at 39.95 each) for my IBM PC along with an instruction manual and a **FREE 2-player version BACKGAM 2™**

Enclosed is my ☐ Check ☐ M.O. ☐ Visa ☐ Mastercard

Card No. _____ Exp date _____

Signature _____

Name _____

Address _____

City _____ State _____ Zip _____

PLEASE PRINT

CIRCLE 429 ON READER SERVICE CARD

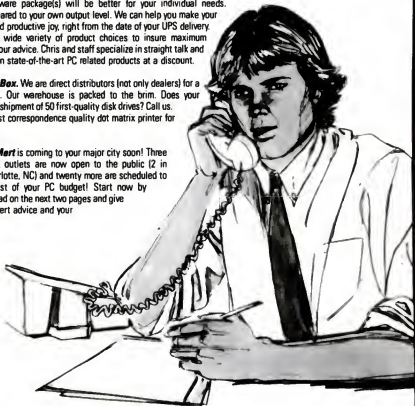
STRAIGHT TALK

Meet Chris Hodges, Sales Director. Eldest son of the oldest existing micro dealer in the southeast. Perhaps the most knowledgeable young man in the IBM-PC enhancement market — certainly one of the most effective. By channeling over 100 major shipments each business day, Chris knows that price and follow-up support are only two reasons for choosing Micro Mart as your primary PC enhancement supplier. Naturally we feel we are the country's price/service leader.

Compatibility is the Key. Choosing the right monitor with the right graphic card. Deciding which software package(s) will be better for your individual needs. Selecting a printer geared to your own output level. We can help you make your PC a cost-efficient and productive joy, right from the date of your UPS delivery. Micro Mart offers a wide variety of product choices to insure maximum compatibility. Ask for our advice. Chris and staff specialize in straight talk and offer only the latest in state-of-the-art PC related products at a discount.

Warehouse vs. P.O. Box. We are direct distributors (not only dealers) for a host of our products. Our warehouse is packed to the brim. Does your company need a rush shipment of 50 first-quality disk drives? Call us. Do you want the latest correspondence quality dot matrix printer for your home? Call us.

Remember Micro Mart is coming to your major city soon! Three Micro Mart discount outlets are now open to the public (2 in Atlanta, and 1 in Charlotte, NC) and twenty more are scheduled to open. Make the most of your PC budget! Start now by checking our product ad on the next two pages and give us a call. Ask for expert advice and your best price.



MICRO MART

SEE OUR AD ON THE NEXT 2 PAGES

floppy disk drives

TANDON TM 100-2
FULLY IBM PC COMPATIBLE

\$239

HALF HT. SHUGART SA455
HIGHEST QUALITY FOR IBM PC • 12 MONTH WARRANTY

networking/protocol conversion

PCnet by Orchid Technology
LO COST, HI PERFORMANCE NTWK, BEST SOFTWARE

DAVONG MultiLink
SHARED RESOURCES UP TO 255 PCs OR XTs

ComNet HI SPEED ETHERNET

CORVUS OMNINET

BLUE LYNX 5251 EMULATOR

printers/plotters

EPSON FX 80 & 100 (160 CPS) **Best Price!**

EPSON MX100 (100 CPS) **Best Price!**

EPSON RX80 F/T **Best Price!**

OKIDATA ML92 & 93 (160 CPS) **Best Price!**

OKIDATA ML 84 (200 CPS) **\$999**

OKIDATA Pacemark 2350 & 2410 **Best Price!**

C-ITOH Prowriter/Prowriter 2 **\$369/\$649**

C-ITOH Starwriter (40CPS)/Printmaster (55CPS) **\$1175/\$1495**

IDS PRISM 80 & 132 (200 SPRINT) Graphics/Color **Best Price!**

DELIVERS BEST LOTUS 1-2-3 CDPY

DIABLO 620 & 630 **Best Price!**

NEW! DIABLO 630 ECS Graphics Capability/Letter Quality in One

NEC 3550 & 7730 Spinnriter **Best Price!**

NEC P2 & P3 (180 CPS) **CALL!**

COMREX CR-1 **\$799**

COMREX CR-2 New! Lo Cost Daisy Wheel **CALL!**

Mannesman Tally 160L **\$679**

GEMINI 10X & 15X Dot Matrix **\$315/415**

TOSHIBA P-1350 (360 X 180 DPI) **CALL!**

TRANSTAR Color Printer **Best Price!**

HOUSTON INST. Plotters **CALL!**

AMDEK Plotters **CALL!**

MICROFAZER (8K-128K) Spooler Starting at **\$139**

PTI/UPS Power Supply 200 Watts, 15 Minutes **CALL!**

ramchips

64 K RAMCHIPS **\$55/\$159**

64K-9 Chip/Upgrade Kit/192K-27 Chip/Upgrade Kit

CALL FOR QUOTE ON QUANTITY CHIP PURCHASES

IRMA REPLACES 3278's WITH PC's
IRMALINE / IRMALETTE

SNA & BISYNC PRODUCTS

3780, 5251, 3274

multifunction boards

QUADLINK **Best Price!**

Run Your Apple Software on IBM-PC

QUADBOARD **\$275/\$429**

QUADRAM • 64K-256K • RAM DISC • Spooler

AST Megaplus Board **Best Price!**

MAXIMUM: 8 functions (64K-512K) W/Opt. Game Pl.

AST SixPak 384K Capacity W/Opt. Game Pl. **Best Price!**

AST I/O Plus **Best Price!**

Serial, Dpt 2nd Serial, Dpt Par., Dpt GAME

AST DiskPlus **Best Price!**

TECMAR Multifunction Boards **Best Price!**

SEATTLE RAM + 3 **Best Price!**

64K-256K • Serial • Parallel • Flash Disk • Clock

TALL TREE 512K J. RAM-w/Jet Drive **\$650**

PROFIT SYSTEMS **\$299/\$680**

64K-512K • RAM PLUS & ELITE

BYAD 64K Multifunction CPM Card **Best Price!**

BABY BLUE 64K CPM Card **Best Price!**

monitors/keyboards

QUADCHROME Super Hi Res. 690x480 **\$485**

PGS Hi Res. 690 Dot RGB **Best Price!**

AMDEK 12" 310 Amber **\$185**

Improved Alternative To IBM Monochrome

AMDEK 12" 300G/300A **\$149/\$159**

ZENITH **Best Price!**

COLBY Keyboard **CALL!**

KEYTRONICS KB **CALL!**

VERBATIM DISKETTES

DATA LIFE • 5 YR WARRANTY • 2 BOX MINIMUM WHEN ORDERED SEPARATELY

Double Sided Box of 10 (**\$39**) Case of 10 (**\$339**)

Single Sided Box of 10 (**\$30**) Case of 10 (**\$249**)

MICROSOFT COMPILERS

Basic • Cobol • Fortran • Pascal

DIGITAL RESEARCH COMPILERS

CBASIC • CP/M-86 • Pascal/MT+ • PL/1

MultiPlan	\$169
SUPERCALC II	\$165
ALPHA Data Base Manager II	CALL!
Accepts LOTUS 1-2-3 File Transfer	
ALPHA TYPE FACES Spec. Char. Gen.	CALL!
T. K. Solver	CALL!
Norton Utilities	\$65
CROSSTALK Microstuf	\$109
SMARTCOM Hayes	\$85
ProKey	\$65
Ccompiler	CALL!
P.C. Tutor	\$55
Friendly Ware	CALL!
Frieze Graphics Screen Dump Utility	\$55
BPS Business Graphics	CALL!
FINANCIER Personal or Tax Series	\$119
Dow Jones Mkt Analyzer	CALL!
Dow Jones Mkt Manager	CALL!
PFS (Write, File, Report, Graph)	CALL!
MOUSE SYSTEMS PC Mouse	CALL!

Multi-Tool Word w/Mouse	CALL!
VOLKSWRITER	\$125
WORDSTAR Professional Series	CALL!
STARBURST (Links Software)	CALL!
MultiMate	CALL!
SuperWriter Sorcim W/P, Speller & Mailmerger	\$169
Final Word	CALL!
VisiWord	CALL!
WORDPLUS-PC W/P Mailmerger	CALL!
Easy Writer II ius	\$199
Easy Filer II ius	\$199
Peach Text 5000	CALL!
Proof Reader (Spelling Checker)	CALL!
VisiOn	CALL!
VisiCorp Series	CALL!
INFOSTAR	CALL!
dBase II Ashton-Tate	\$399
FRIDAY!	CALL!
Bottom Line Strategist	CALL!
QUICKCODE	CALL!
dGraph	CALL!
Memory Shift	CALL!
SHOEBOX Desk Top Organizer	CALL!
System Backup (Unlocking Program)	CALL!

graphic cards

QUADRAM Color Card HiRes	CALL!
PLANTRONICS COLOR PLUS Biplaner Super HiRes	CALL!
GRAPHICS MASTER Tecmar	CALL!
HERCULES	CALL!
Monochrome Graphics/Supports Lotus 1-2-3	
AMDEK MAI Color Graphics/Monochrome	CALL!
• 640 x 400 Res. • 8 Pages Storage • Parallel Printer Port	
• 128K DRAM Allocates 96 K User RAM • Erasable UV Prom	
USI Monochrome/Color Graphics	CALL!
• Parallel Printer Port • Flicker Free Scrolling • 32K • True DMA	
SCION 640x480 Color Card	CALL!

hard disks

TECMAR Expansion Chassis/Hard Disk	CALL!
DAVONG 5,10,15,21,32 MEG/F	Starting at \$1395
TOP-LINE 12.5, 20, 35 Hard Disk w/Streamer Tape/Can't Advertise!	CALL!
SYSGEN Back Up for IBM XT	CALL!

*IBM is a registered trademark of International Business Machines

ORDERS ONLY
1-800-241-8149

MICRO MART

6889 Peachtree Industrial Blvd.
Norcross, GA 30092

For Information 1-404-449-8089/Op. 5

modems

HAYES SMARTMODEM 1200	CALL!
HAYES SMARTMOOEM 300	\$209
HAYES 1200B New Plug-In Modem Card	CALL!
RIXON (1200-4800-BAUD)	CALL!

STEP UP TO THE ULTIMATE

A POWERFUL 4 IN 1
(SOON TO BE 5 IN 1)
PROGRAM FOR IBM PC
AND COMPATIBLES.
ALSO A UNIVERSAL
Z 80 CP/M VERSION!

E-COM

E-COM will soon be the fifth member of "THE ULTIMATE" program. The power of electronic mailing can now be yours through your modern and "THE ULTIMATE." Your personalized letters, memos, and invoices can now be sent anywhere in the country within 48 hours. Ask your dealer about this free enhancement.

DICTIONARY

- 13,000 words (initially)
- Add your own words
- Delete words

MAIL MERGER

- Personalized letters
- Labels
- Lists

DATA BASE

- On-screen formatting
- Multi-level select and sort
- Reports
- Form fill-in
- Column movement

WORD PROCESSING

- Menu driven
- Complete cursor movement
- Footnoting
- Simultaneous printing and editing
- Global search and replace
- Many other powerful features

**THE ULTIMATE
IN USER FRIENDLINESS!!!**

**TAKE THE FIRST STEP!
Get a \$110.00 INSTANT
rebate with this ad:**

Suggested retail price	\$385.00
Less instant rebate	\$110.00
Your price with this ad	\$275.00

(offer good thru Dec. 31, 1983, only)

**CONTACT YOUR NEAREST
PARTICIPATING DEALER TODAY!**

COMPUTER CREATIONS, Inc.
766 El Camino Real, Suite D
San Carlos, CA 94070
(415) 595-4466

*Computer
Creations*

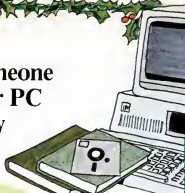
CIRCLE 253 ON READER SERVICE CARD

E-COM is a Registered Trademark
of the U.S. Postal Service

IBM is a Registered Trademark
of IBM, Inc.

CP/M is a Registered Trademark
of Digital Research

Give Someone and Their PC a Holiday Gift!



Available for the Holidays...

Using the IBM Personal Computer, VisiCalc

Robert Crowley
Learn VisiCalc step-by-step on your Personal Computer, work on projects—some easy, others not—in a wide range of application areas.
1982, 256 pages, \$19.95, ISBN 0-03-062634-X

Programming the IBM Personal Computer: BASIC

Neil Graham
From switching your Personal Computer on to editing text, handling random and sequential files—even making music—this easy-to-follow book shows you how.
1982, 251 pages, \$17.00, ISBN 0-03-063657-1

Programming the IBM Personal Computer: Pascal

Neil Graham
Accessible to beginners, this structured presentation shows how to program with the powerful computer Pascal developed by IBM for the Personal Computer.
1983, 256 pages, \$16.95, ISBN 0-03-061982-3

Programming the IBM Personal Computer: UCSD Pascal

Seymour F. Pollack
A self-paced introduction to UCSD Pascal (and programming on the Personal Computer, using the UCSD P-System. Many examples and problems, both serious and whimsical.
1983, 323 pages, \$17.00, ISBN 0-03-063669-8

Using the IBM Personal Computer: WordStar

CJ Pavinen
Even for those unfamiliar with the Personal Computer, this book's many examples and projects will easily lead to mastery of the WordStar word processing system.
1983, 272 pages, \$16.95, ISBN 0-03-062657-1

Programming the IBM Personal Computer: FORTRAN 77

Robert Rouse and Thomas Bugniz
Examples, problems, and exercises from science and engineering illustrate both introductory and advanced topics, including IBM's FORTRAN compiler.
1983, 240 pages, \$17.00, ISBN 0-03-063668-X

*Your IBM Personal Computer: Use Applications, and BASIC

David E. Cortesi
An elementary, non-threatening introduction to the Personal Computer—set-up and testing, disk files, VisiCalc and other software, and the rudiments of BASIC.
1982, 253 pages, \$17.00, ISBN 0-03-063671-X

Book/Diskette Packages—Soon to come for most of our IBM Personal Computer titles!

Each package consists of a book and its diskette in a durable, dirtproof jacket. The diskette offers such handy tools as sample programs, test data, and useful subroutines. Diskettes are not available separately.

For the New Year—Choose the Book or the Book+Diskette Package!

Using the IBM Personal Computer:

PFS: File/PFS: Report
W. Robert Crowley
Spring 1984, 250 pages (approx.), ISBN 0-03-069399-3

Using the IBM Personal Computer:

IBM EasyWriter
Ada W. Foister
Spring 1984, 275 pages (approx.), ISBN 0-03-063736-8

Programming the IBM Personal Computer: COBOL

Neil Graham
Early 1984, 400 pages (approx.), ISBN 0-03-063993-X

Executive Computing in BASIC:

The IBM Personal Computer
Peter Meers
Early 1984, 250 pages (approx.), ISBN 0-03-064129-2

Using the IBM Personal Computer: Graphics

Jeffrey L. Posdamer
Spring 1984, 192 pages (approx.), ISBN 0-03-063187-X

Programming the IBM Personal Computer, Business BASIC

Wilson T. Price
Early 1984, 250 pages (approx.), ISBN 0-03-063746-5

Executive Computing: The IBM Personal Computer

John Zussman and David E. Cortesi
Spring 1984, 300 pages (approx.), ISBN 0-03-068014-7

*Programming the IBM Personal Computer:

Organization and Assembly Language Programming
Mark A. Franklin
Spring 1984, 400 pages (approx.), ISBN 0-03-062862-8

*No diskette planned for this title

Other Gift Possibilities—Available Now!

UNIX Programmer's Manual in Two Volumes
Bell Laboratories
The primary reference/resource to the UNIX operating system. Volume I is a reference manual; Volume II gives background and tutorials on aspects of the system.

Volume I
1983, 425 pages, \$34.95, ISBN 0-03-061742-1

Volume II
1983, 816 pages, \$34.95, ISBN 0-03-061743-X

Inside CP/M: A Guide for Users and Programmers, with CP/M 86 and MP/M 2
David E. Cortesi
The classic guide and reference manual to this popular operating system, with both tutorial and reference sections.

1982, 571 pages, \$25.95, ISBN 0-03-059556-4

Microcomputer Applications in the Classroom
Alan Holmstrom, Utah State University
A broad-based, comprehensive introduction that stresses computer-assisted instruction, computer-managed instruction, and building computer literacy.

1983, 225 pages, \$12.95, ISBN 0-03-063637-X

Mail this Coupon Today!

TO: Hope Innell
CBS Educational and Professional
Publishing
383 Madison Avenue
New York, NY 10017

PLEASE SEND ME (check ISBNs of items desired):

AVAILABLE FOR THE HOLIDAYS:

- ☐ ISBN 0-03-062634-X (VisiCalc)
- ☐ ISBN 0-03-063667-1 (BASIC)
- ☐ ISBN 0-03-061982-3 (Pascal)
- ☐ ISBN 0-03-063669-8 (UCSD Pascal)
- ☐ ISBN 0-03-062657-1 (WordStar)
- ☐ ISBN 0-03-063666-X (FORTRAN 77)
- ☐ ISBN 0-03-063671-X (Use)
- ☐ ISBN 0-03-061742-1 (UNIX Vol. I)
- ☐ ISBN 0-03-061743-X (UNIX Vol. II)
- ☐ ISBN 0-03-059556-4 (Inside CP/M)
- ☐ ISBN 0-03-063637-X (Classroom)

AVAILABLE IN THE NEW YEAR:

- ☐ ISBN 0-03-068399-3 (PFS: File)
- ☐ ISBN 0-03-063736-8 (EasyWriter)
- ☐ ISBN 0-03-063993-X (COBOL)
- ☐ ISBN 0-03-064129-2 (Exec BASIC)
- ☐ ISBN 0-03-063167-X (Graphics)
- ☐ ISBN 0-03-063746-5 (Business BASIC)
- ☐ ISBN 0-03-068014-7 (Exec Comp)
- ☐ ISBN 0-03-062862-8 (Assembler)

For each order, please enclose the price, 5% for shipping, 75¢ handling, plus applicable sales tax. Or ☐ We will bill you, or charge your ☐ VISA ☐ Mastercard.

No. _____

Exp. Date _____

Signature _____

Bill to: _____

Name _____

Company _____

Street _____

City _____ State _____ Zip _____

Ship to: _____

Name _____

Company _____

Street _____

City _____ State _____ Zip _____

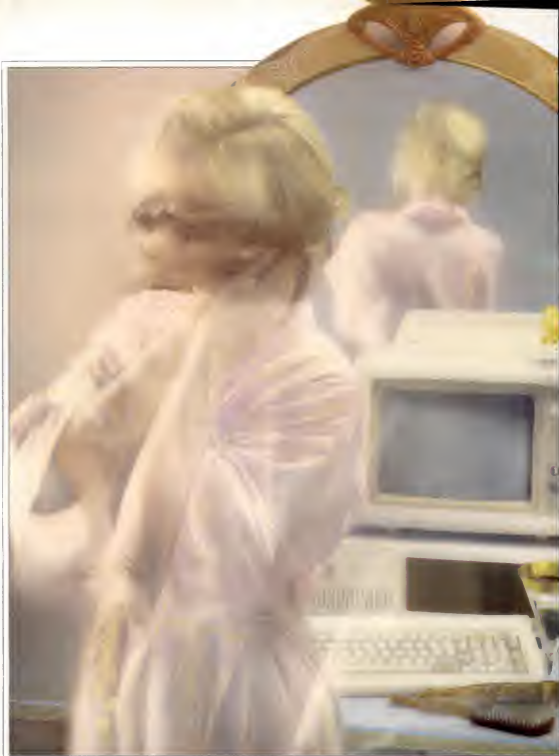
Offer valid in USA only, prices subject to change without notice.

PCF

CBS Educational and Professional Publishing
383 Madison Avenue, New York, NY 10017

ORDER BY PHONE...USE OUR TOLL-FREE 800 NUMBER!
(800) 227-1617 ext. 336 (in California, (800) 772-3545 ext. 336)

IBM is a registered trademark of the International Business Machines Corporation. WordStar is a registered trademark of Micropro. VisiCalc is a registered trademark of VisiCorp. UCSD P-System is a registered trademark of the Regents of the University of California. PFS is a registered trademark of Software Publishing Corporation.



While some search for true love, a certain wild and crazy element among the CompuServe set seek digital thrills in ModemLand.

COMPUSEX:

Reach Out And Touch Someone

Last spring, I bought a modem and began computing in the fast lane. In fact, it was so fast and racy that you could accurately describe my system's capability as downright 1200 bawdy.

It all began innocently enough when I strolled into my local Radio Shack and bought a membership in CompuServe, the information service that (for \$5 an hour during nonprime time) can hook you up to more than 800 different databases—everything from the weather in East Africa to the latest price for gold futures. The service's most popular section, however, is its live, on-line "CB" simulation,



Photography by Dennis Bellemont, hand colored by Alice Layer

in which crazed keyboard jockeys from coast to coast get together to argue, gossip, joke, philosophize, and make singas-bar small talk. There are bulletin boards around the country that offer similar real-time relating, but none are as huge or as geographically diverse as CompuServe.

It was CB that my two prepubescent daughters were itching to try. Within minutes after logging on, they were dragged into private talk mode by a fellow who seemed delighted to be talking to CB'ers of the female persuasion. After a cursory chat about their careers (he was an electronics engineer; the girls described themselves as "students"), "Anthony" asked, "Are you ladies cute?" Then he asked about the length and color of their hair. The kids found this line of inquiry fascinating, and went on in detail about their shoulder-length blonde and chestnut tresses. From there the "conversation" went something like this:

HE: HAVE YOU BEEN INTRODUCED TO COMPUSEX YET?

THEY: No we haven't, but introduce us.

HE: JUST RESPOND WITH WHAT-EVER YOU FEEL LIKE.

(pause)

THEY: When does it start?

HE: I LOVE YOU DARLING <LONG FRENCH KISS>

(pause)

THEY: Phtooooey!

HE: <CARESSING YOUR HAIR>

THEY: I haven't washed it for ten weeks!

HE: <FONDLING YOUR BREASTS>

THEY: Get the hell off!

HE: DON'T LIKE IT, HUH?

THEY: Anthony, we have a confession to make. You happen to be talking to a twelve and nine year old kid! We just are very sophisticated because we come from New York.

(pause)

THEY: Hello? ... Hello?

Poor Anthony's come-on brought a new dimension to the concept of "touch typing." But at the time, I assumed he was a lone CompuPervert, lookin' for love in all the wrong databases. In the weeks and months that followed, however, I learned that CompuSex—along with its less flashy but equally sought-after sibling, computer-ship—is a staple out there in the global village. "Whoever would have

thought," as one of my CB pals, Changeup, typed one night during a bemused discussion of the phenomenon, "that sexual technique would ever be dependent upon spelling!"

What's in a Name?

If you've never used CB, a little explaining is in order. When you first log



POOOR ANTHONY'S
come-on brought a new
dimension to the
concept of "touch
typing."

onto CB, you're asked for your handle. (You can change yours at any time, simply by typing the command /han.) My own handle is Lynx, chosen because it's androgynous but slinky, and because it sounds like my real name—although I metamorphose into Journalynx when I'm interviewing people, and into Lynx the Amazon when I'm spoiling for a fight.

Handles can reflect the user's job, computer brand, home city, or favorite fantasy, and they're generally pretty creative. A few personal favorites of mine are Conan the Librarian and Baroness Von Slink. The regulars on CB tend to have handles they

use all the time, so their friends can find them. People who are cruising on CompuSex are sometimes readily identifiable by their handles alone. On one recent weekend night, they included Funky Slut, Studley Hungwell, **NAKED**, Spanker, Programmed for Fun, HornyMale Wants Girl, Sex Maniac, Knockers, and a few too lascivious to be reprinted without overheating my circuit board.

Once logged on, you can use the status command (/sta) to find out how many CB'ers are on each of 36 channels. (Channel 1 is the official "adult" channel; Channel 33 is the unofficial channel for gay men; 17 is for kids 17 and under; and most of the rest are up for grabs. You can then type /tun to tune to the channel of your choice. If you want to find out who else is on CB, or on a particular channel, the user status command (/stat) will bring you a scrolling list of each user's handle, the "nodes" they're calling from ("NYC" for New York; most of the rest resemble airport codes), their permanent CompuServe i.d. numbers, the channels they're currently tuned to, an asterisk indicating whether or not they're in private talk mode, and their "job numbers"—temporary numbers assigned by the system to everyone on CB. To go into private talk mode, you request to /talk and give the person's job number. Then you wait for the person to confirm with a command to /talk to you.

Once you know the commands, the trick is to think fast, type even faster, and learn to translate all your normal body language and emotions into the verbal domain of CB personality. If someone gets off a funny line, for example, you're supposed to type "hehehehe," or perhaps "<slapping thigh>." In other situations, you might <blush>, <sigh>, <snarl>, or even be seen <hanging head in shame>. On a good night, people pass around joints, which you're expected to share by <drawing deeply>.

My friend Bluegrass was once a member of a CB gang. Actually, he only got to join the gang after becoming the first recorded mugging statistic on CompuServe. It all began one night when he was "lurking" (CB slang for eavesdropping without making one's presence known) on a bunch of people who were bemoaning their high CompuServe bills. Someone named Sweetcakes suggested robbing a bank, and began passing out black hats to

COMPUTER HUT™

COMPARE
OUR
SERVICE & PRICE!

SPECIAL OF THE MONTH

IBM-PC & XT
CALL FOR
PRICE



HARDWARE FOR IBM-PC

DISK DRIVES

Tandon TM100-2 DS/DD	\$235
TEAC FD-55B Slimline	\$269
SHUGART SA-455 half-high	\$259

MAYNARD ELECTRONICS

Floppy Disk Controller	\$159
FDC w/Par. Port	\$219
FDC w/Ser Port	\$239
MK RESEARCH	CALL
Ram 64K Exp. to 512K	\$199
Ram 64K Exp. to 512K + SP	\$229
Color Graphics for IBM-PC	CALL

QUADRAM

Quadboard-PP, SP, C/C, Mem + s/w	
64K.....	\$295 256K.....\$439
Quad 512 + SP, Mem with s/w	
64K.....	\$249 512K.....\$659
MICROFAZER (print buffers) ..	CALL
Quadlink	\$499

AST RESEARCH

MegaPlus II 4-Funct 512K + s/w	\$679
ComboPlus II 4-Funct 256K + s/w	\$499
6-Pack 5-Funct 256K + s/w	\$499

HERCULES

Hi Res Graphics 720 x 384, PP, + s/w	\$389
---	-------

FREDRICKS ELECTRONICS

COLORPLUS 640 x 200, 16-Color + s/w	\$369
--	-------

MBI

Monte Cerlo 5-Funct 64K-1M	\$319
----------------------------	-------

QCS

Big Blue 4-Funct + Z80 for CP/M & hard disk I/F with s/w	\$469
---	-------

HARD DISK - IBM & APPLE

DAVONG

5MB	\$1450
10MB	\$1650
15MB	\$2250

MODEMS — HAYES

Micromodem II for Apple II	\$275
Smartmodem 300	\$225
Smartmodem 1200	\$535
NOVATION, US ROBOTICS	CALL

MONITORS

AMDEK	
Video 300G....	\$135 300A.....\$149
Video 310A.....	\$179
Color I.....	\$299 Color II.....\$449
Color III.....	\$379

PGS

HX12 HI Res RGB monitor	\$509
SANYO, NEC	CALL

PRINTERS

EPSON w/Graftax	
RX-80.....	\$379 FX-80.....\$599
MX-80 FIT.....	\$449 MX-100.....\$649
brother®	
HR1 A Par.....	\$699 Ser.....\$819
HR-15 Par.....	\$489 Ser.....\$529

C-ITOH

STARWRITER F-10 P or S	\$1195
PROWRITER 8510 P	\$399
PROWRITER 8510 S	\$579
PROWRITER2 1550 P	\$690
PROWRITER2 1550 S	\$749

DYNAX

DX-15 Par.....	\$469 Ser.....\$499
----------------	---------------------

STAR MICRONICS

Gemini 10X.....	\$329 Gemini 15.....\$499
-----------------	---------------------------

OKIDATA

82A.....	\$399 83A.....\$629
84P.....	\$1049 84S.....\$1149
92P.....	\$479 92S.....\$559
93P.....	\$799 93S.....\$869

NEC

3510.....	\$1485 7710.....\$1995
3515.....	\$1479 7715.....\$2039
3530.....	\$1575 7720.....\$2495
3550.....	\$1829 7725.....\$2559
	7730.....\$1995

COMREX, IDS, DIABLO CALL

ACCESSORIES..... CALL



SOFTWARE FOR IBM PC

WORDPROCESSING

WordStar ..	\$299 Word Perfect \$319
MailMerge ..	\$159 EasyWriter .. \$129
SpellStar ..	\$159 Volkswriter .. \$129
EasySpeller II	\$159
Select	\$339

SPREADSHEET/GRAPH

Lotus 1-2-3 ..	\$355 Multiplan .. \$189
TK! Solver CALL	Fast Graph .. \$189
SuperCalc II \$199	VisiCalc .. \$189
Visi Trend/Plot	\$229

ACCT/FINANCIAL

Home Accountant Plus	\$99
Eagle Money Decision	\$129
Tax Manager	\$179
Peach Pack (GLIAR/AP)	\$369

DATA BASE MGT.

dBase II ..	\$419 EasyFiler .. \$279
TIM III	\$349 Quick Code .. \$219
Visi Dax ..	\$189 Visi File .. \$239

ANY S/W NOT LISTED? . CALL



Apple IIe Starter

80 col, disk, monitor	\$1699
--------------------------	--------



HARDWARE FOR APPLE

MICROTEK

Dumping-GX \$99	DMP-16.....\$179
BAM-16	\$99 BAM-128.....\$349
RV611-C	\$89

RH ELECTRONIC - Super Fan II. . \$59

ORANGE MICRO Grappler + . \$129



CPM/CARD \$319 Z-CARD \$135

SATURN

Ram 64K ..	\$299 Ram 128K .. \$429
------------	-------------------------

PROMETHEUS

Versacard	\$149
Graphitti Graphics	\$99

DISKS DRIVES FOR APPLE



RANA Elita	CALL
TAVA Data Drive ..	\$239

FULL LINE APPLE S/W CALL

Apple II Compatible systems CALL

DEC Rainbow 100 CALL

ANY PRODUCT NOT LISTED? CALL ASK ABOUT OUR REPAIR SERVICES

COMPUTER HUT ORDERS & INFORMATION ORDER-LINE ONLY

OF NEW ENGLAND INC. (603) 889-0666 (800) 525-5012

201 Elm St., Nashua, NH 03060

FRANCHISE INQUIRIES INVITED

All products usually in stock for immediate shipment and carry full manufacturers' warranty. Price subject to change — this ed prepared two months in advance. You get the lowest price. We honor personal checks — allow 10 days to clear. COD up to \$200 and 3%. Visa, MasterCard add 3%. For shipping, insurance and handling add 3% or \$5.00 min. APO & FPO orders add 12%. Include phone number. Call (603) 889-0666 for a return authorization number prior to returning any material. Apple is a trademark of Apple Computers Inc. IBM is a trademark of IBM Corp.

the assemblage. Suddenly, Bluegrass hurtled. "If I don't have a bat, does that mean I'm a victim?" Next thing he knew, he was ordered to put his hands up. They took his gold watch and his gold teeth, and decided not to kill him only after someone pointed out that if they let him live, they could rob him again the following week. When Saturday night rolled around again, the group decided that Bluegrass had been a pretty good sport, and they asked him to ride with them—albeit with a dusty rose hat. "The gang finally settled down on a raunchy little ranch off Channel 10, and we kept it going for about 8 months," Bluegrass recalls.

They were soon known as the Seedy Weed Funny Farm, and they were tough. "We used to hang CB wrong-doers regularly. Some flake-o would come on to the channel we were on and start making remarks we considered insulting, and Gunner would say, 'Hey, Blue, where's the rope?' Sweets would say, 'Didn't we smoke it last weekend?' and Cowboy would say, 'I thought of that—there's some fresh rope in the truck.' And while the flake-o would be saying, 'what the hell are you clowns talking about?' we'd be busily picking out a tree."

Beginnings

Most of us start our CB careers by lurking around on an open channel until we find someone to strike up a chat with. The CB equivalent of "What's your sign?" is

ONE OF
*the most popular people
on CompuServe is a
bright, warm, witty
woman who can't speak
and is confined to a
wheelchair.*

"What are you using?"—which is to say, "What kind of computer do you have?" Reader, beware: If you happen to have an IBM, you'll be treated like a living Vultion bag by the hordes of VIC-20 owners. More than once, I've been asked, "OH, ARE

YOU RICH???" It's gotten to the point where I'm toying with the notion of saying I have a Cray. But there's also snobbery at the high end, particularly in the area of capital letters, the unmistakable sign that a person (a) has an el cheapo computer, or (b) is too technically wimpy to figure out how to change log-on defaults. The in computer, as far as I can gauge, is the slick Radio Shack Model 100, which combines high cost and affordability—a sort of digital T-Bird.

Actually, CB is like nothing so much as high school. There is an unabashed emotional intensity that manages to be simultaneously cliquish. For instance, it's traditional to send flamboyant <hugs> and <warm fuzzies> to greet your on-line buddies, like sophomores passing their friends in the stairwell between bells. There are popular folks and wallflowers, and the cultivation of a CB identity is sardonic business. The difference is that in real life, high school and beyond, we're routinely judged by our social categories: age, race, attractiveness, disability, gender, sexual preference, what we do for a living. On CB, none of these matter. There's a story currently making the rounds among the compuserps about a famous science fiction writer who was introduced to CB at a computer show. After his handle, Famous Writer gave his real name and then spent a frustrating 20 minutes communicating with blasé CB'ers who assumed this was some sci-fi freak's idea of an interesting persona-for-a-day.

People start by communicating some essence of themselves. The social categories get filled in later, after rapport is already established. One of the most popular people on CompuServe is a bright, warm, witty woman who can't speak and is confined to a wheelchair. Still another is a woman who is both deaf and blind and uses a special Braille instrument to communicate. This ultra-democratic aspect is unquestionably one of CB's biggest charms, and—without putting too fine a socio-mystical point on it—one of the things that makes it seem like a quantum leap into some future world of digitized spirit. As Hyperher, a Los Angeles IBM owner, puts it: "I always had a fantasy about being made love to by someone who was blind... because I wanted someone to experience the me who I am inside, not what is apparent to the naked eye. This is as close as I'll get!"

Translated into the sexual venue, this means that you can turn yourself into Catherine Deneuve, even if you're not really beautiful (or even if you're not really female). You are what you type.

Thunder and Lightning

"Your true feelings come out when you're invisible," says Thunder, "and all your inhibitions fall away." Thunder is a 25-year-old programmer and Apple II+ owner from South Carolina. I "met" him recently when I set off on a series of on-

YOU ARE
what you type.

line interviews with people about their CB relationships. Thunder is a hard-core CBer with a \$400 a month habit, and he says his on-line friendships (most of which are nonsexual) are so intense that his off-line friends are jealous.

When Thunder has CompuSex, he says it tends to be as much romantic as pornographic: He likes to tell his partners stories about knights doffing their suits of armor to bed fair damsels, and the people in his stories are always in love. Nor is he electronically promiscuous. "I don't think people on CB should attempt such things until they really get to know a person," he maintains. "CB can be used as a cheap thrill medium, but as in real life, I prefer a 'real' relationship and not some quickie." Once, however, Thunder had a sobering experience. In the midst of a hot on-line session, his /talk partner suggested that she get off her modem and call him on the telephone, thus heating things up even more. Unfortunately, it didn't work out that way. "When we talked [voice line]," he reports, "the walls went back up."

A female CBer also pointed out that CompuSex can lead to worse jealousy than the kind one encounters in real life, where lovers at least usually have the good grace to sneak around. "I used to see that asterisk next to the handle of the guy I'd had CompuSex with, and I knew he was doing it in /talk with another woman—and it really drove me crazy." Then there was the night someone called

Business letters to go.*



*(or, how to write effective business letters without really writing.)

Often, when it comes to business letter writing, it's difficult to find the time. Or even the right words.

Add the routine business letters you should write during each busy day, and writing becomes an endless chore.

Even if you use a personal computer.

So you end up *not* writing all the letters you should. Or working overtime just to catch up.

Now there's help.

Business letters at your fingertips.

With The Business Letter Library[®], you get hundreds of concise, unique business letters, on disk. Subtly written by a leading business communications expert.

They're ready to go. And ready to use with your personal computer and most any popular word processing software.

All you have to do is select the letter you need; customize, print, and mail. To clients, customers, business associates, vendors; *anyone* you do business with.

You get letters to start a business deal. Set up a meeting. Make a point. Close a sale. And *more*.

It's your choice.

For routine correspondence, you can make quick changes to any letter in The Business Letter Library.

Or use the on-screen KeyStyle[®] mode to write a custom, highly personalized version of each letter.

Either way, The Business Letter Library can help you write effective business letters to fit almost any business situation.

You're done!

By the time you've read this ad, you could've written a great business letter. It's really that easy.

And it's really that good: Whether you need to write many routine letters, or that single, very important one, you'll get *results*.

So turn business letter writing into a quick, easy, productive part of your day with The Business Letter Library.

For a full demonstration of The Business Letter Library, see your Dealer. Or call us at (714) 642-1827

The Business Letter Library can be used with the IBM Personal Computer, Apple II or IIx, DEC Rainbow, and many other microcomputers. Compatible with most popular word processing software packages.

The Letter Library Series[®]

711 West 17th St., Unit B10. Costa Mesa, CA 92627

Look for future products in the Letter Library Series to meet your business, professional, and social letter-writing needs.

KeyStyle, The Business Letter Library, and The Letter Library Series are trademarks of the Delta Point Corporation. © Apple Computer, Inc. © 1983, Delta Point Inc. All Rights Reserved.

CIRCLE 187 ON READER SERVICE CARD

THUNDAR *says his on-line friendships (most of which are nonsexual) are so intense that his off-line friends are jealous.*

"Ready Female" went into /talk just long enough to ascertain each poor chap's predilection and then ran back to open channel to kiss 'n' tell. ("Hey, so-and-so is into whip!" etc.) Still, most people I interviewed were thrilled with their newfound compusexuality. As one Texas man noted with enthusiasm, "It's like having a dirty book that talks back to you." Several people pointed out that CompuSex relieves partners of worries about birth control or herpes. And a Corona owner from Georgia added that CB was one of the few places where he could meet and "date" women who "know that this is not a Funny Type-writer."

Meeting in Real Time

Some CB friends get together at organized parties, and many others eventually arrange to meet. Several marriages have even come out of CB, the most notorious of which actually took place earlier this year on-line, with the minister at one computer, the bride and groom at another, and dozens of assembled guests from all over the country. There was a lot of <wiping eyes>, and at the end, the throwing of CB-style rice: !!!!!!!

But then there's Connie, a 35-year-old Florida woman, who is about to get the first CB divorce. Connie describes herself as someone who has "always had a great deal of difficulty meeting people. I never knew what to say and was afraid of appearing foolish." When Connie got interested in computers—she now owns three different Radio Shack models and a Texas Instruments—she profited professionally (getting promoted from hook-keeper to head of computer operations at her workplace, since she was the only person who understood computers) and also

began to lose her paralyzing shyness. CB, she says, gave her the spontaneity of face-to-face contact, but with the freedom to edit and censor that actual conversation lacks.

Her first experience with CompuSex was completely unexpected; a man she was in /talk with asked her what she was wearing, and proceeded slowly to take all her clothes off. When Connie told her husband about this episode and a few others that followed, they decided to separate. "He now refers to 'my other lover'—the computer," according to Connie, and in fact, at this point in her life, she says she prefers CompuSex to the analog variety. "I will not talk CompuSex with anyone unless that person really appeals to me," she adds. Like Thunder, she uses the word "romantic" to describe what she likes most about CompuSex. "I think some people can't understand how it can be that way. Those people are missing something very special." Luckily for Connie, her current marital difficulties are being made easier to bear by the fact that she has a supportive friendship in her life—another CB'er named Blue Bomb. "I don't know what I would have done without him," she says.

Remaining Chaste

Personally, I'm still a CompuVirgin—but out of monogamy, not morality, not being the kind to make judgments about what people do behind the privacy of closed disk drive doors. I have, however, made some terrific compufriendships.

My best friend is Lady Editor (she's married to Bluegrass, who runs with the electronic posse), and I met her very early in my CB career—so early, in fact, that I couldn't understand why she ignored my request to /talk. "But I'm a lady writer!" I protested on the open channel. The next day Lady E. sent me a letter (via CompuServe electronic mail) saying that if I were really a lady writer—and not a male CompuSex Cruiser—she'd be glad to arrange a time to chat. Lady E. turned out to be a West Virginia newspaper editor with a passion for horses, chocolate, feminist politics, folk music, and telecommunications. We started to "talk" several times a week last May, mostly about computers and the newspaper business, but eventually about relationships, and about our childhoods. There's something about sitting in the green phosphor cocoon of one's

computer at 3 a.m., laughing out loud, and knowing that someone else is doing the same thing 800 miles away, that makes one feel ridiculously intimate. Lady E. and I are both of the opinion that we would have become close friends if we'd met under some other circumstances—but part of what we have in common is our fascination with the medium in which we did meet, and our willingness to go with it. In fact, Lady E. and I now know each other so well that I've begun to refer to her in conversation the way I would about any friend—sometimes much to the bewilderment of my noncomputing, real-world friends.


My second best friend is Changeup, a San Francisco software editor, whom I originally met during a fight with someone whose handle (Stormtrooper) I took

I *VE BEGUN to refer to Lady Editor in conversation the way I would a friend.*

extreme political exception to. As I was donning my Lynx the Amazon leather-lady gear and practicing my <uppercut to the jaw>, Changeup suddenly appeared on the channel and stuck up for me, making old Stormy feel like he'd just lost the Normandy beaches. Changeup is very funny and articulate, and I recently tried to cajole him into having CompuSex with one of the Channel 1'ers so that I could interview him for this article. I even tried to help him think up irresistible handles, like "Surfer Stud" (Californians are absurdly popular on CB) or "For a Hot Time, Call Job # . . ." but he wouldn't listen. So far, he reports stumbling into a lot of terrific, meaningful friendships with women who are sick of compuharrassment and want to talk to a nice guy for a change.

My 12-year-old, meanwhile, was unfazed by her experience at the hands of Anthony the compumolester and is now having regular dates with an 11-year-old boy from Long Island. On line, of course. /PC

PC contributing editor Lindsay Van Gelder is also a contributing editor to Ms. Magazine.



Shift into Ultradrive

Targa™ The ultimate mass storage machine for your IBM®-PC and other microcomputers.

With up to 30 megabytes of hard disk capacity, you can handle data bases that would fill phonebooks. And access, process, and update that data in seconds.

Which, after all is what serious personal computing is all about.

The Purr of Performance.

Targa is one beautiful piece of engineering.

Fast. Data glides in and out at 5 million bits per second.

Quiet. Even with disks spinning at 3600 rpm inside.

And solid. Targa is built to deliver uncompromising performance.

Automatic Is Standard.

Just plug the Targa into your PC, and you're ready to go.

Targa comes with plain English instructions and plenty of software. Easy to use, clearly documented programs help you transfer data in and out, use powerful system utilities, and diagnose problems.

The Luxury Model at Economy Prices.

You may order your Targa directly from the CMC factory, one of the world's oldest microcomputing hard disk manufacturers, or, contact us for the name of your local dealer.

Powerful standalone Targa mass storage systems start at \$1550. Considerably less than many lesser systems.

Targa 50	5 megabyte models from \$1945
Targa 100	10 megabyte models from \$2345
Targa 150	15 megabyte models from \$2745

Higher capacity models with a bunch of options and features are also available along with TargaTape™ backup and TargaNet™ network systems.

Take a Test Drive.

Call CMC for the name of the dealer nearest you. Or, for more information about our exciting line of Targa products, call toll free **800-CMC-INTL.** (In Washington, call (206) 885-1600.)

Give your personal computer a much needed boost in mass storage horsepower and give yourself a big lift in productivity.

CMC International

BELLEVUE, WASH. 98005

Targa for the IBM-PC is supplied with both MS-DOS and CPM-86 compatibility. Other computers supported under CP/M. IBM-PC is a registered trademark of International Business Machines Corporation. MS-DOS is a registered trademark of Microsoft, and CPM-86 is a registered trademark of Digital research, Inc.



TARGA BY CMC

CIRCLE 177 ON READER SERVICE CARD

**NEW
FROM
COLUMBIA**

Shown are IBM PC* compatible programs. The Columbia VP portable runs MS-DOS* plus five other operating systems.



INTRODUCING THE COLUMBIA VP PORTABLE. IBM PC COMPATIBILITY AT AN AFFORDABLE PRICE.

World Headquarters:
9150 Ramsey Road
Columbia, MD 21045
(301) 992-3100
TWX 710-602-1891
Central Region:
Chicago, IL
(312) 399-1212

West Coast:
2901 MacArthur Blvd.
Suite 211
Newport Beach, CA 92660
(714) 752-5245
San Francisco, CA
(415) 349-1227
Telex 277778

Europe:
Luisenstr. 94
4050 Muenchengladbach 2
West Germany
02166-47097
Telex 852452

**Call our distributor
nearest you.**

**Advanced Management
Systems**
Aurora, CO
(303) 752-2972
**Renaissance Technology
Corp.**
Concord, CA
(415) 676-5757

**Commercial Computer
Sales**
Atlanta, GA
(404) 256-8190
Miami, FL
(305) 266-9569
Manland, FL
(305) 629-6114

RPC Electronics
Pittsburgh, PA
(412) 782-3770
Cleveland, OH
(216) 418-0550
Access Systems
Wellesley, MA
(617) 237-7743

Distributors in Australia, Austria, Belgium, Colombia, Denmark, Greece, Hong Kong, Israel, Italy, Kuwait, Malaysia, Netherlands Antilles, Norway, Philippines, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, Turkey, United Kingdom, Venezuela.



Ahead in industry compatibility.

Today, the Columbia VP portable takes on hundreds of IBM PC compatible software programs and IBM PC add-ons or peripherals.

What's more, six other Columbia-supported operating systems are available — CP/M-86, CP/M-86, (Concurrent CP/M-86, OASIS-16[®] and XENIX[®] available soon) — stretching the Columbia VP's software compatibility beyond any other personal computer you can buy.

Get started with thousands of dollars worth of software FREE.

Every Columbia VP portable is shipped with fully supported software that will save you thousands of dollars on your initial purchase. That means your Columbia is up

and running right out of the box.

Included is:

Perfect Writer[™]
Perfect Filer[™]
MS-DOS[®] with
RAM disk
Macro/86 Assembler
MS-BASIC[®]
Diagnostics
Space Commanders[™]
Fast Graphs[™]

Perfect Speller[™]
Perfect Calc[™]
CP/M-86[®]
BASIC[®]
Asynchronous Communications Support
Columbia Tutor
Home Accountant Plus

Full feature performance at an affordable price.

The Columbia VP portable features an 8088 16-bit CPU, 128K RAM, (additional 128K, optional), 640K in dual disk drives, one IBM PC compatible expansion slot, one serial and one parallel I/O, IBM PC-compatible keyboard, and a 9" built-in monitor with graphics.

The best news of all is the price: \$2,995—including software. And

the Columbia is built with lasting value in mind. Rugged single board design plus the flexibility to expand and personalize your Columbia VP.

Made in U.S.A.—supported worldwide.

All Columbia hardware and software are backed by our dealers and distributors worldwide with national service provided by Bell & Howell. Call for the name of the dealer in your area. Let us show you a whole new world of performance and value.

COLUMBIA

DATA PRODUCTS, INC.

Compatible Data Systems, Inc.
Rochester, NY
(313) 337-3909
Philadelphia, PA
(215) 383-0180
NY City, NY
(212) 259-1440

Crystal Computers, Inc.
Lexington, KY
(603) 314-1771
Plymouth, MI
(313) 837-3083
Southwest Data Products, Inc.
Houston, TX
(713) 861-0180

Hall Mark Electronics
Dallas, TX
Call your local
Hall Mark office or call
(214) 313-5920
Southeastern Data Products
Lynchburg, VA
(804) 384-6000

MP Systems
Dallas, TX
(214) 385-8885
Wayborn Corporation
Garden Grove, CA
(714) 354-4320

Micro Distributing, Inc.
Comptons, B.C., Canada
(604) 944-0622
Wetaskiwin Computers
Wetaskiwin, Alberta, Canada
(403) 352-8302

Peripherals Plus, Inc.
Montreal, Quebec, Canada
(514) 364-5554
Tele-Terminals
Brooklyn Park, MN
(612) 336-6000
Milwaukee, WI
(414) 785-9221

Zephyr Industries, Inc.
Seattle, WA
(800) 562-5057
WA WATS
(206) 241-1980
Tel-Aids Industries
Arlington Heights, IL
(312) 870-7101

Perfect Software, Perfect Writer, Perfect Speller, Perfect Filer, and Perfect Calc are trademarks of Perfect Software, Inc. Home Accountant Plus is a trademark of Continental Software Company. Fast Graphs is a trademark of Interactive Software, Inc. IBM and IBM PC are trademarks of International Business Machines. CP/M and MP/M are registered trademarks of Digital Research, Inc. DOS is a trademark of Dorset Inc. MS-DOS, MS-BASIC, and MS-XENIX are trademarks of Microsoft Corporation. © 1987

THE GIANT KILLER



Vanquishes The High Cost Of Plotters

Small, smart and cost effective, the DMP-40 single-pen plotter puts big-plotter power at the command of the small-system user. With this amiable and competent aid at your side, you can create colorful 8½ x 11" and 11 x 17" graphics—images of professional quality for stand alone use, binding into reports or as overhead transparencies for group presentations.

Circles, arcs, ellipses and general curves are automatically generated by robust internal firmware, freeing you and your computer from wasteful low-level busywork.

By plotting in increments of only 0.005", you are assured of virtually step-free traces. The result is precisely defined graphics of high accuracy and solid repeatability.


Standard RS-232-C interfacing matches the DMP-40 to all current computers.

Multicolor plots on the DMP-40 are a simple matter since built in firmware and most commercial software provide 'pause' commands for pen changing.

These and more big-plotter capabilities are yours at small-plotter cost.*

For the name and location of your nearest distributor, call 512-835-0900 or 1-800-531-5205 outside Texas, or write Houston Instruments, 8500 Cameron Rd., Austin, Texas 78753. In Europe contact Bausch & Lomb NV, Rochesterlaan 6, 8240 Gistel, Belgium, Tel 059-27-74-45, Tlx 846-81399.

*U.S. retail \$995.

BAUSCH & LOMB 
houston instrument division

CIRCLE 366 ON READER SERVICE CARD

We Support Over 300 Software Packages With Quality Forms

Quality is what separates our forms from the competition. We have created forms which consist of rich colors, quality paper, and detailed design — as opposed to plain, bleak forms.

We know that image is important to your company. Whether you send invoices and statements to clients or payroll checks to employees, our forms will better represent you.

So, if your company operates software such as Accounting Plus, BPI, CYMA, Continental, Great Plains, MBSI, Open Systems, Peachtree, TCS, or over 290 others, let us enable you to be a cut above. We are Checks To-Go.



**Checks
To-Go**

P.O. Box 425, La Mesa, California 92041
Nationwide (800) 854-2750 • In California (800) 552-8817
Local (619) 460-4975



Free shipping
within
Continental U.S.
on all software
compatible forms.



24-Hour turn-
around on blank
forms.



Free choice of
four imprinting
colors.



Custom logos
available.



W-2's and 1040's
available in small
quantities.

SIMPLE.

StationMate.™ For uncomplicated computer connections.

Creating a micro and mini computer network has been costly and confusing. Communications hierarchy has prevented many types and various kinds of equipment from sharing information. Until now.

Introducing StationMate. One unit that joins mini computers, micro computers, terminals, and printers. It's transparent. So different brands and types of computers and peripherals can easily interface. StationMate allows you to construct a comprehensive communications network. *Inexpensively.*

Users can select the information they need from the unit they want. StationMate can address any port in the network either by its assigned digital code or by its common identifying name. So everyone has access to all the local or remote computers, mass storage files, and peripheral devices connected in the network. *Immediately.*

StationMate provides local area networking with XLAN™, the simple communications concept from Complexx. All you need is StationMate and an inexpensive shielded-pair cable.

Besides local area networking, StationMate permits access to remote workstations via an internal dial-up modem. And it serves as a gateway for teleprocessing access to all LAN resources. You couldn't get all of this in one unit. Until now. And the suggested retail price is only \$1450.00. StationMate makes communications simple. *Incredibly.*

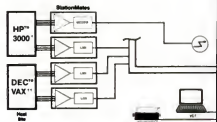
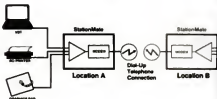
StationMate. The link you've been missing.

See your local dealer or contact Complexx for the name of the dealer or distributor nearest you. Complexx Systems, Inc., 4930 Research Drive, Huntsville, AL 35805. 205/830-4310.

COMPLEXTM



Teleprocessing



Local Networking

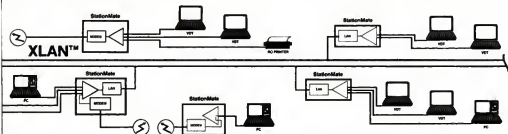
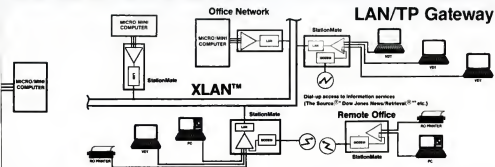
*The Source is a registered trademark of the Source Telecomputing Company, a subsidiary of the Reader's Digest Association.

**Dow Jones News/Retrieval is a registered trademark of Dow Jones & Company, Inc.

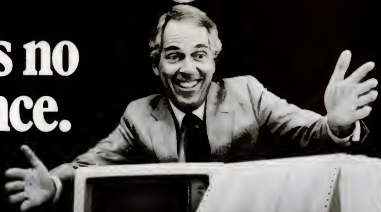
HP 3000 is a registered trademark of Hewlett Packard.

††DEC VAX is a registered trademark of Digital Equipment Corporation.

XLAN Micro Communications System



There is no difference.



Unless you want the best price, performance and quality.

The other guys' printers have always been adequate. But why settle for adequate when you can have the best. The quiet new Riteman personal printer from Inforunner for your computer.

Made possible by over 38 years of manufacturing expertise, Inforunner has produced the best printer ever. Inch for inch, we've packed more heavy-duty quality and performance inside our compact Riteman printers at a lower cost than the competition.

Compare feature for feature. With the Riteman you get uni- or bi-directional printing running easily at 120 cps with friction, pin, and tractor feed at no extra cost. You can use your own stationery, labels, fan fold or pin feed paper. So all your printing gets done faster.

The Riteman is Epson-compatible for interfacing with most personal computers. Like

Apple and IBM. And with a wide variety of print modes including italics, super and subscripts with true descenders. So your letters and other printouts look their best.

And it runs with many popular software packages including graphics.

See for yourself how easily this incredibly low-priced printer, with the best price/performance/quality combination, fits into a briefcase — at your nearest computer dealer.

ASK YOUR DEALER or call toll free (800) 824-3044. In California (800) 421-2551. Inforunner Corporation, 1621 Stanford Street, Santa Monica, CA 90404.

CIRCLE 257 ON READER SERVICE CARD

Inforunner's Riteman

DISTRIBUTED WORLDWIDE



WOULD YOU SHELL OUT \$1000 TO MATCH WITS WITH THIS?

MEET YOUR MATCH. MEET INFOCOM GAMES—PERHAPS THE BEST REASON IN SOFTWARE FOR OWNING A PERSONAL COMPUTER.

In fact, people have been known to purchase computers and disk drives solely for the purpose of playing our games. And they haven't been disappointed. Because Infocom's prose stimulates your imagination to a degree nothing else in software approaches. Instead of putting funny little creatures on your screen, we put you inside our stories. And we confront you with startlingly realistic environments alive with situations, personalities, and logical puzzles the like of which you won't find elsewhere. The secret? We've found the way to plug our prose right into your imagination, and catapult you into a whole new dimension.

If you think such an extraordinary experience is worth having, you're not alone. Everything we've ever written—**ZORK**® I, II, and III, **DEADLINE**, **STARCROSS**, and **SUSPENDED**—has become an instant

best-seller. For the simple reason that Infocom offers you something as rare and valuable as anything in software—real entertainment.

At last, you can fritter away your evenings playing a computer game without feeling like you're frittering away your computer investment.

Step up to Infocom. All words. No pictures. The secret reaches of your mind are beckoning. A whole new dimension is in there waiting for you.

INFOCOM™
The next dimension.

Infocom, Inc., 55 Wheeler St., Cambridge, MA 02138



For your Apple II, Atari, Commodore 64, CPM II, DEC Rainbow, DEC RT 11, IBM, NEC APC, NEC PC 9800, Osborne I, TI Professional, TKS-80 Model I, TKS-80 Model III

**COMPLETE
DATA COMMUNICATIONS
SYSTEM NOW AVAILABLE
AT YOUR NEAREST
OUTLET.**



Introducing

ACCESS 1-2-3™

Now for the
IBM PC
and others.



Novation PC1200B™ Modem
+
Crosstalk XVI™ software
+
all accessories.

Access 1-2-3 is a simple idea. It means you can now walk into your nearest computer outlet, buy one package off the shelf and walk out with the best fully integrated communications system for your personal computer.

What we've done is taken the best 1200 Baud modem, our PC1200B—plus Crosstalk XVI, the best available software—added instructions and whatever else is needed for your particular computer—and put them all in one box.

The advantages:

First, you get a *total* system. No missing parts. No wrong parts, either. You can be sure you have all you need and all you need to know.

Second, it's the best system you can put together. Absolutely no compromises. You simply take it home, open the box, hook it up, and start up. Your only surprise will be how really easy it all works.

The best modem.

It's our PC1200B modem in a format to fit your particular computer.

The Large Scale Integrated circuitry is our own 3rd and 4th generation design. It's the most advanced technology, eliminating all kinds of parts and running better and cooler.

The right software.

The Crosstalk XVI programmers have pulled off a little magic. Without compromising a bit on all the things you want and need to do, they've made them all easier to do on our PC1200B modem.

No wonder Crosstalk XVI is recognized as the best in its field.



Easy 1-2-3 instructions that go with the Access 1-2-3 series help make your life easier, too. You don't have to know a byte from a baud to get going. High-tech talk is out. Plain English is in.



Cables and connectors.

If your particular computer needs a cable and connector, they'll be in the package. No big deal, of course—unless you've gone through the frustration of piecing together a system with something less than expert help. Well, no need to worry here. With Access 1-2-3 it doesn't matter who's minding the store. The expertise is built in.

Available now.

IBM PC, IBM PC XT,
Columbia Multi-Personal,
Compaq Portable, Corona
Portable PC.



The first models in our Access 1-2-3 series are at your dealers right now.

More models are being added and we'll soon cover all of the important personal computers. See your dealer for the latest list.

And the price.

Packaging up a sensible system has let us do something sensible for the price, too. Entire system—only \$595.

Included: CompuServe

Your Access 1-2-3 system now carries an extra bonus—two hours of free demonstration time on one of the most extensive and best data banks, CompuServe. A nice way for your computer to meet the data world.

Talk to your dealer today.

All of the features you want and need.

- LSI smart modem, 300 or 1200 baud, full duplex, uses just one slot on all models.
- Crosstalk XVI software.
- Directory for single stroke log-on to 40 separate entries.
- Auto dial (TouchTone or rotary), auto log-on, auto answer.
- Telephone line status, busy detect and automatic redial.
- Auto monitoring through computer speaker.
- Captured data to printer, disk or buffer transfer.
- Disk to disk transfer.
- Extensive error-checking and automatic retransmission.
- Display of transmission time for each file with baud rate and available disk space.
- Complete on-line control of stop bits, parity, baud rates, duplex.
- Modem self-test.
- Full 2 year warranty.

ACCESS 1-2-3 by

Novation



Novation, Inc., 20409 Prairie St., Box 2875
Chatsworth, CA 91311 • (800) 423-5419
In California: (213) 996-5060

Access 1-2-3 and PC1200B are trademarks of Novation, Inc.
Crosstalk XVI is a trademark of Microsoft Inc.

CIRCLE 660 ON READER SERVICE CARD

NOW • YOUR • PERSONAL • COMPUTER CAN • BE • WORTH • ITS • WEIGHT • IN GOLD



Think it's about time your personal computer started earning its keep? Then you're going to enjoy our new **Chart Trader Plus™** package.

Now you can play the stock, commodity and options markets like a pro. And maybe make yourself a lot of money in the process!

Designed for your Apple® or IBM PC®, Chart Trader Plus places all the information you'll need to chart, analyze and predict price movements right at your fingertips.

COMPUTERIZED CHARTING MAKES ANALYSIS QUICK, EASY AND ACCURATE.

Thanks to Chart Trader Plus you won't have to spend hour after hour hand-drawing charts to see developing trends. Up to 240 days of market activity can be displayed on your screen in seconds.

Chart Trader Plus features a dynamic, full-color graphic charting system that enables any number of tracking studies to be superimposed on your chart at one time. And with your printer, a chart can be printed in *less than a minute*.

DATA FILE CREATION, MANAGEMENT AND UPDATING ARE AUTOMATIC.

Because it's in the most commonly used format, Chart Trader Plus' Data File Management Program places a virtual library of prices and statistics at your beck and call. You can easily create, update and maintain your files using the Data File program. And if you don't want to manually input data, telephone data acquisition is a breeze.

Plus, the package's unique **AUTORUN™** feature does all the work for you. With **AUTORUN** you can set a procedure, then go have dinner. By the time you get to dessert, your data will have been loaded, studies run and charts created and printed. All automatically!

CHART TRADER PLUS COSTS LESS.

At \$199.95, Chart Trader Plus is a bargain. Competitive systems sell for as much as \$2,000. But Chart Trader Plus is an add-as-you-grow package. There's no waste. You get just the functions you want... when you want them. You aren't forced to buy "extras" you may never use.

And once you master Chart Trader Plus, you can easily upgrade your analytic ability. Advance to one of our other software packages—you'll only pay the price difference.

LET YOUR PERSONAL COMPUTER PAY FOR ITSELF. AND THEN SOME.

Chart Trader Plus lets you take full advantage of your computer's money-making capabilities. With the investment analysis tools the pros use at your fingertips, success is within your reach.

To get the Chart Trader Plus, visit your nearest software dealer today. Or order direct from Omega MicroWare, Inc. by calling:

1-800-835-2246



222 SO. RIVERSIDE PLAZA CHICAGO, IL 60606
312-648-4844

*AUTORUN not available for IBM.

Apple Computer is a registered trademark of Apple Computer Inc.
IBM PC is a registered trademark of IBM Corporation.
Chart Trader Plus is a trademark of Omega MicroWare, Inc.
Software by Omega Management, Inc.

© Omega MicroWare, Inc.

*What is a Pascal program? What is "strong typed data"?
And what are the differences between the two versions
of Pascal offered by IBM?*

Pascal

For The IBM PC

*Pascal Programming For The IBM
Personal Computer*

Ted G. Lewis
Addison-Wesley Publishing Co.
Reading, MA 01867
288 pages, \$15.95 trade paperback
ISBN 0-201-05464-7

CIRCLE 539 ON READER SERVICE CARD

Excerpted from *Pascal For The IBM Personal Computer* by Ted G. Lewis, copyright © 1983, by permission of Addison-Wesley Publishing Co., Reading, MA 01867. All rights reserved.

This book is about Pascal programming on the IBM Personal Computer. In the chapters that follow, you will be gradually introduced to the power and flexibility of two Pascal dialects. The IBM Pascal dialect is an extension to the ISO (International Standards Organization) standard Pascal that emphasizes the "systems" features needed for machine level programming. You can think of these extensions as a kind of high-level assembler language.

The UCSD Pascal dialect is an extension to the ISO standard Pascal that

emphasizes the needs of application level programming. You can do extended arithmetic, graphics, and screen editing kinds of programs with the UCSD Pascal dialect.

Unfortunately, this simple division between these two dialects is a gross oversimplification. Both languages are capable of systems programming, and with some assembly language routines, both are capable of application programming. To really understand the differences you will have to read the remaining chapters! But to get a quick overview, suppose we examine these two languages in the large.

IBM Pascal

IBM Pascal was developed by Microsoft, Inc. to be a highly efficient, optimized code translator. Considerable effort went into making programs run fast when compiled into machine language. One consequence of this is that three passes are made over your original source program in order to translate it into machine language.

IBM Pascal programs are translated into machine instructions that execute under the IBM DOS operating system. The

result is a machine language program that can be combined with other machine language programs. Once translated, an IBM Pascal program cannot be distinguished from any other machine language program.

The IBM Pascal compiler not only requires three time-consuming passes over your source program, but it also requires 128K of main memory. You should keep this memory requirement in mind if you have not yet purchased a machine with 128K of memory.

An IBM Pascal object program (machine language version of your program) usually requires approximately 25K of run time support routines. A run time support routine is a subprogram that resides in memory while your program is running. It helps your program do input and output, arithmetic and so on.

UCSD Pascal

UCSD Pascal was developed at the University of California at San Diego under the guidance of Dr. Kenneth Bowles. Later it was licensed to SoftTech Microsystems for commercial distribution. The original version has evolved to

MICROXPRESS

COMPETITIVE PRICES • PROFESSIONAL SERVICES



5 1/4" FULL HEIGHT INTERNAL MOUNTING FLEXIBLE DISK DRIVES FOR IBM PC & XT, COMPATIBLE "HEART" AND OTHER SMALL COMPUTERS

20K 5 1/4" DOUBLE-SIDED 48TR, 320 304K	\$ 235
20K 5 1/4" DOUBLE-SIDED 48TR, 320 304K	225
20K 5 1/4" DOUBLE-SIDED 48TR, 320 304K	230

5 1/4" 1/2 HEIGHT INTERNAL MOUNTING FLEXIBLE DISK DRIVES (INCLUDES STRAP KIT TO MOUNT IN FULL HEIGHT FOOTPRINT) & MS-DOS 2.0

20K 5 1/4" DOUBLE-SIDED 48TR (2) DRIVES FOR 395	
QUINTRA 142 DOUBLE-SIDED 48TR (2) DRIVES FOR 425	
TRAC 142 DOUBLE-SIDED 48TR (2) DRIVES FOR 475	
TRAC 142 DOUBLE-SIDED 48TR (2) DRIVES FOR 475	
TRAC 142 DOUBLE-SIDED 48TR (2) DRIVES FOR 475	
IBM 4 DRIVE ADAPTER CABLE	Call

8" THINLINE FLEXIBLE DISK SUBSYSTEM (SHOWN ABOVE FULLY ASSEMBLED & TESTED WITH COMPLETE DOCUMENTATION, CABLE & SOFTWARE)

1-8481 DUAL DRIVE, DOUBLE-SIDED, 2 AMB	1,495
1-8481 SINGLE DRIVE, DOUBLE-SIDED, 1 2MB INCL. FILLER PANEL - SECOND DRIVE CAN BE ADDED LATER	995
8" DISK CONTROLLER	195
CPM & CPM II SOON AVAILABLE	Call

IBM PC DOS SOFTWARE UTILITIES FROM TALL TREE SYSTEMS

J FORMAT ENABLER USE OF 5 1/4" D/S 48TR & 8" FLEXIBLE DISK DRIVES PLUS OTHER FEATURES FOR IBM PC DOS 1.10 VERSION 1.78	30
J FORMAT-2 SAME AS J FORMAT ABOVE FOR IBM PC DOS 2.0	35
J WINDIVE ENABLER USE OF WINCHSTER SUBSYSTEMS FOR IBM PC DOS 2.0	35
JETWIVE ENABLER IMPLEMENTATION OF ELECTRONIC DISK FOR IBM PC DOS 2.0	35
J UTILITIES INCLUDES J FORMAT-2, WINDIVE & JETWIVE	95

CD CONTROL DATA CORPORATION DISKETTES

1242-00 5 1/4" SINGLE-SIDED, SINGLE DENSITY WRITE PROTECT NOTCH & HUB RING (Box of 10) Special 19.95	
1244-00 5 1/4" DOUBLE-SIDED, SINGLE DENSITY WPM & HUB RING (Box of 10) Special 20.95	
— 8" SINGLE OR DOUBLE-SIDED, SINGLE DENSITY WPM & HUB RING, VARIOUS FORMATS	Call

IBM PC 5 1/4" & 8" DISK CONTROLLERS

BIYARD ELECTRONICS	
PEC 5 1/4" FLOPPY DRIVE CONTROLLER	175
POCPS 8" FLOPPY CONTROLLER	195
SANDSTAR 5 1/4" & 8" AVAILABLE	Call

MULTIFUNCTION & RAM EXPANSION

ACT RESEARCH INC.	
SDRAM PLUS	
SDRAM PLUS	64K CLOCK/CALENDAR, 1 SERIAL & 1 PARALLEL PORT (EXPANDABLE TO 2 SERIAL & 1 GAME PORT) - 295
MEGAPLUS II	INCLUDES SUPERIORE & SUPERPOOL
MEGAPLUS II	64K CLOCK/CALENDAR, 1 SERIAL PORT (EXPANDABLE TO 2 SERIAL & 2ND SERIAL & 1 PARALLEL & 1 GAME PORT) - 295
10 PLUS II	INCLUDES SUPERIORE & SUPERPOOL
10	CLOCK/CALENDAR & SERIAL PORT (EXPANDABLE TO 2ND SERIAL & 1 PARALLEL & 1 SERIAL PORT) - 190

ACT RESEARCH INC. (CONT.)

OPTIONAL (MAY BE ORDERED INSTALLED OR AS ADD-ONS)	
SDRAM PLUS	SERIAL PORT #2 40
SDRAM PLUS	PARALLEL PORT 40
SDRAM PLUS	GAME PORT 40
MEGAPLUS II	EXPANDS MEGAPLUS II FROM 256K TO 384K 199
MEGAPLUS II	EXPANDS MEGAPLUS II FROM 256K TO 512K Call

QUADRAM CORP. QUADRAMS

THE IBM APPLE LINK INCLUDES SYSTEM SOFTWARE	
3000	COMPUTER WITH 64K GAME PORT DISPLAY GENERATOR, DISK INTERFACE, I/O INTERFACE 599
QUADRAM	INCLUDES QUADRAM SOFTWARE 64K (EXPANDABLE TO 256K), CLOCK CALENDAR, 1 SERIAL & 1 PARALLEL PORT 325
QUADRAM	INCLUDES QUADRAM SOFTWARE 64K (EXPANDABLE TO 256K), CLOCK CALENDAR, 2 SERIAL PORTS 325

RAM

80	SET OF 64K CHIPS	Special 45
----	------------------	------------

PRINTERS

DOT MATRIX	
EPSON	FX-80 (80 CPS) 499
EPSON	FX-100 (100 CPS) 499
OKIDATA	82 (120 CPS) 525
OKIDATA	82 (120 CPS) 545
NEC	NEC (100 CPS) 495
DASHWHEEL	80-1 (100 CPS) 738
BROTHER	NEC 2560 1,875
SONE	SPRINT & PLUS (40 CPS) 1,475

MODEMS

NATES	
SMARTMODEM 300	230
SMARTMODEM 1200	548
SMARTMODEM 1200B	499
SMARTMODEM SOFTWARE	15
INFORMATION	
SMARTCAT 120 (300 BAUD)	199
SMARTCAT 120-212 (1200 BAUD)	485
DATA CAPTURE SOFTWARE	15

COLOR GRAPHICS & GRAPHICS CARDS

HERCULES	GRAPHICS CARD	395
IBM	MULTI DISPLAY CARD PAR PORT	349
PLANITRONICS	COLORPLUS PAR PORT WITH THE SMARTSCAN SOFTWARE	395

MONITORS & GRAPHICS CARDS

AMBER		
VIDEO 300	12" HI-RES GREEN	144
VIDEO 310A	12" AMBER MONITOR	185
COLOR 1	12" COMPOSITE COLOR	299
COLOR 1	HI-RES RGB MONITOR	499
POS		
RE-12	12" HI-RES COLOR (RGB)	499
USI		
P12	AMBER 12" MONITOR	160
1600C	12" COLOR MONITOR (RGB)	325

version IV which runs on the IBM Personal Computer and many other microcomputers.

One of the strong features of the UCSD Pascal language is that it is part of a portable operating system called the p-system. The p-system includes a filter for managing disk files, an editor for composing programs, and translators for converting assembly language programs and FORTRAN programs, as well as UCSD Pascal programs into executable instructions.

Portability is obtained at a price, however, because programs in the p-system are translated into p-code, not machine language. A p-code program is a program containing hypothetical machine language instructions called p-code instructions. P-code instructions are much more compact than native machine language instructions, but they "execute" more slowly.

The p-system interprets p-code programs much like a BASIC interpreter directly executes BASIC instructions. The p-code interpreter simulates a p-code machine, and this is why it is sometimes called a p-code simulator. The p-code simulator is a machine language program.

The p-system runs UCSD Pascal programs much slower than they would run if they were translated into machine instructions. Thus, the price of portability is performance.

Version IV of the UCSD p-system includes a native code generator that can translate most p-code instructions into equivalent machine language instructions. The translation is not 100% complete, however, and so you must continue to run your programs under the p-system.

The advantage of native code translation, however, is that of increased speed. Much of the lost performance is regained (not all), but the resultant program is considerably larger. So, you must decide which is more important to you: size or performance. (You can selectively translate each subprogram into native code.)

P-code is slow but compact. One consequence of this is the fact that the entire p-system will execute on a 64K machine. Thus, only 64K of memory is required.

The compiler does its translation in one pass. This means you can expect fairly quick translations. Very little in the way of run time support is needed by your p-code program because they are built into the p-



MICROXPRESS

(714) 632-8512 DISCOUNTS AVAILABLE

305 S. State College Blvd., Suite 135, Anaheim, CA 92806



CIRCLE 341 ON READER SERVICE CARD

PC MAGAZINE 444 NOVEMBER 1983

Never again worry about computer theft or damage

What could be better than full replacement?

By now, you've probably heard or read about **SAFWARESM** Insurance for microcomputers. But you may still wonder just what it protects, or whether it's really worth the investment. If you've never lost any part of your computer system or software, you probably don't yet realize the limitations of most standard insurance coverages. Or the agonies you could face in trying to recover even the simplest piece of peripheral equipment.

What do you mean it's not covered?!

Operating your computer system without **SAFWARE** protection is fine as long as you don't have to worry about an accident or loss. But what if you came home one night to discover you'd been robbed? Or that a pipe had burst and caused water damage? Or that your system, too, had fallen victim to a leading destroyer of microsystems—a power surge? All events beyond your control. If something like this should happen to you, you're likely to find out the hard way just how limited your standard insurance policy's protection really is. And no matter how little or how much you have invested in your computer system, discovering that it's not covered can be an expensive lesson.

Now you can be sure

SAFWARE was developed by an insurance professional who was shocked to learn that his very own personal computer was at risk. Can you imagine? What he discovered was that his homeowners insurance policy excluded coverage as soon as he began operating his first business program. Even his simplest spreadsheet voided coverage. Because most homeowners policies won't cover any equipment used for business, no matter how infrequently. Out of this need was born **SAFWARE**. A simple, easy-to-understand coverage you can count on. Full replacement coverage of hardware, software and media, after a low \$50 deductible.

With **SAFWARE** there's no need for you to schedule equipment or software as you do with the "rider" type of policies. So your coverage can grow with your system, providing protection for its full value rather than each individual item. This will be especially important to you if you're ever planning

to buy additional equipment or software. Even just one peripheral.

What the editors are saying

Desktop Computing: "...Given the amount of money that business users spend on computer equipment...it's not too farfetched to say that an insurance policy may be the most important new accessory that you could add to your desktop computer system."

Computer Journal: "...Your personal computer might not be safe at home. If it is not insured, then you're running the risk of losing the thousands of dollars you've invested..."

Personal Computing: "...Replacing hardware may be more of a problem than you thought it would be...That's why (a computer consultant) suggests that you get the computer insured."

Wall Street Journal: "...Columbia National General Agency introduces a policy that covers home computers regardless of use. The usual premium: about \$75 a year."

An All-Risk, no risk offer

SAFWARE is an All-Risk plan of insurance, which means that it covers all hardware, all purchased software, and all media. Your complete system is protected against theft, fire, accidental damage, even

damage sustained while the computer is being transported in your car. **SAFWARE** even covers damage caused by power surges...the leading destroyer of microcomputers. And, now, **SAFWARE** is available on a no risk basis. If you are not completely satisfied with the protection afforded by **SAFWARE**, you may return the policy for a full refund within the first 10 days after you've received it.

Thousands have said "yes!"

Since it was first introduced in 1982, thousands of computer owners, like you, have said "yes!" to the **SAFWARE** offer. Owners of systems from the smallest portable micros to larger sophisticated business systems are finding that **SAFWARE** offers the most affordable and complete security. And the simplest peace of mind available to ensure carefree computing.

The cost: pennies a day

As you can see from the table, the annual premium for a typical system consisting of a \$3,000 processor, a disk drive and printer worth \$1,100, and \$900 in software, is just \$60. And you can save even more since the cost of insurance for personal computers used for business may be tax deductible. To determine your rate of coverage, just add

up your total system value. Then, find the premium in the table.

Easy to order

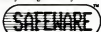
Choose from three simple ways to pay for your complete **SAFWARE** protection: Call the toll free phone number listed and we'll charge your premium to your **VISA** or **MasterCard**. Or, you can mail us your order along with your check. Or, send us the coupon and charge your policy to your credit card.

Total Hardware, Media & Software System Value	Annual Premium
Up to \$ 2,000	\$ 35
\$ 2,001-\$ 5,000	\$ 60
\$ 5,001-\$ 8,000	\$ 75
\$ 8,001-\$11,000	\$ 90
\$11,001-\$14,000	\$105
\$14,001-\$17,000	\$125
\$17,001-\$21,000	\$140
\$21,001-\$24,000	\$155
\$24,001-\$27,000	\$170

Call toll free for rates on higher coverages.
Not available in DC, HI, KY, LA, ME, MS, NV, SC, WY.

800-848-3469

(In Ohio call 800-848-2121)
Phones open 8 a.m. to 8 p.m., Monday through Saturday



Columbia National General Agency
88 E. Broad Street, Columbus, OH 43215

With **SAFWARE** you get...

- Full replacement coverage.
- Freedom from worries of fire, theft or accident.
- Ultimate in power surge protection.
- Costs as low as \$35 a year.

Yes, my computer needs immediate protection.
Please issue my **SAFWARE** Insurance Policy.

Name

Street

City

State Zip

System value \$

☐ Check Enclosed ☐ VISA ☐ MasterCard

Card #

Exp. Date

No risk. You may return policy for full refund within 10 days. Coverages and limits are subject to the terms, conditions and exclusions in the policy.

Mail to: **SAFWARE**, P.O. Box 02211, Columbus, OH 43202

code simulator.

Portable p-code programs can be run on any microcomputer that has the p-system software. For the software developer, this means you can write your program once for the IBM Personal Computer and it will run on a number of other microcomputers, too.

System Requirements Compared

The table in Figure 1 summarizes the differences between UCSD and IBM Pascal system requirements. This is a very broad comparison, but it does tell you what kind of hardware you will need in either case.

The IBM dialect requires one diskette for each of three passes. Since the UCSD version is a single-pass compiler, it requires only one diskette. Both versions can run on a single diskette system (especially on double-sided drives), but it is not recommended.

Notice the difference in main memory requirements. The UCSD p-system is very compact, but your Pascal programs may be very large. Therefore, you may need 128K of main memory in either case. This memory difference should not be a consideration in choosing between one version of Pascal and the other. You will soon find that 128K is desirable for all but the most

trivial programming.

Both dialects support the monochrome display and the color adapter. However, UCSD Pascal includes turtle graphics, which allows you to do color (and B&W) graphics. If you plan to do graphics at all, the UCSD Pascal language is the best choice.

Programs written for DOS can be easily transferred to other IBM Personal Computers running under control of DOS. However, programs written for the p-system can run on another computer under control of the p-system. (A licensing fee allows you to distribute the p-system with your programs.)

If you plan to do system level programming and you want machine language object programs as your final result, then the IBM Pascal system is probably your best choice. What you must remember is that you are trading portability for performance.

Pascal Language Features

Standard (ISO) Pascal is very similar to the original language invented by Niklaus Wirth. The goal of the original language was to help students learn "proper" programming skills, and to be easily implemented on a variety of computers. This goal has long since been forgotten in the

rush towards modern structured programming languages.

Most "real-world" versions of Pascal go beyond the pedagogical standard. They attempt to do everything that a professional programmer wants of them. IBM Pascal and UCSD Pascal are no exceptions.

Figure 2 summarizes the overall features of these two dialects of Pascal.

***B**OTH languages support character strings as a built-in data type.*

Both languages support character strings as a built-in data type. IBM Pascal actually supports two kinds of strings. An L-string can vary in length, whereas a simple string cannot. The UCSD string and the IBM L-string are very similar.

Both languages support string processing intrinsic functions. An "intrinsic function" is a built-in function. IBM Pascal is a little bit confusing, however, due to the L-string and simple string data types.

Graphics (turtle graphics) and sound reproduction are supported by a library of pretranslated routines in UCSD Pascal. You should use this language if you plan to program applications in music, games, or graphical design.

IBM Pascal does not directly support screen cursor control, but a machine language routine for this operation is included in this book. The UCSD language, on the other hand, includes the intrinsic function GOTOXY for cursor control.

Both languages support separately compiled subprograms. A "unit" is a cluster of procedures, functions, and data that can be separately compiled, stored on disk, and then "linked" into any other program. Units can be very useful when building large systems.

IBM Pascal modules are also separately compiled programs. They are similar to units.

UCSD Pascal provides a way for you to dynamically overlay pieces of a large program into memory. This means you can run programs that are too large to fit into

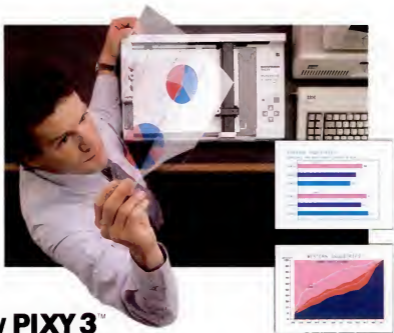
Figure 1: System Requirements

	IBM	UCSD
Diskettes to Compile	3	1
Manuals	1	2 (Language, only)
Memory required	128K	64K
Disk Drives recommended	2	2
Printer?	Up to 2	Up to 1
Display	B&W or Color	B&W or Color
Operating System	DOS	p-System

Figure 2: Language Features

	IBM	UCSD		IBM	UCSD
Strings	yes	yes	Systems programming	yes	no
Graphics	no	yes	Packed data	no	yes
Sound	no	yes	Initial values	yes	no
Units (separate compilation)	yes	yes	Structured constants	yes	no
Modules (separate compilation)	yes	no	Control break	yes	yes
Concurrent processes	no	yes	Control cycle	yes	no
Program chaining	no	yes	Case-otherwise	yes	no
Direct files	yes	yes	Procedures as actual parameters	yes	no

IF YOU MAKE YOUR POINT WITH GRAPHICS, MAKE IT STICK.



NEW PIXY 3[™] MICROPLOTTER,

\$795* Nothing makes more sense out of repetitious data than seeing it portrayed graphically.

Presentations that use pie charts, solid areas and bar graphs sum up data succinctly, to make an impression that can give you an important edge.

For that kind of persuasiveness, PIXY outperforms everything else in its price range.

PIXY's high resolution graphics are drawn in increments of 0.1 mm. It's faster at 200 mm per second. And plots with three pens automatically.

There's also a variety of powerful graphics packages available, all of which produce sophisticated results with ease. Including BPS,[™] GrafTalk,[™] Graphwriter,[™] and uGRAF.[™]

And with PIXY's versatile intelligence, you can do even more to create the exact graphic you need to present your point with impact.

And make it stick.

Call toll-free for more information and the name of your nearest dealer: 800-447-4700. In Illinois call 800-322-4400.

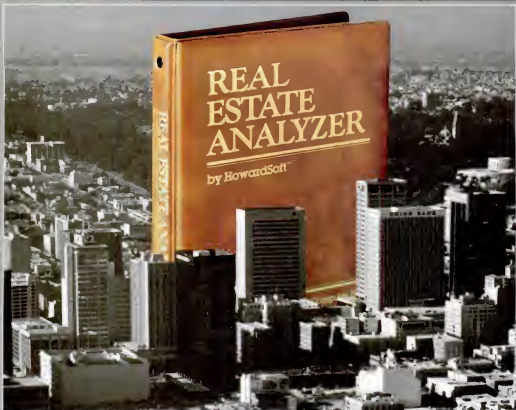
CIRCLE 311 ON READER SERVICE CARD

**MANNESMANN
TALLY**

In Canada, call 617-641-9783 *Manufacturer's suggested U.S. retail price with parallel interface

BPS is a trademark of Business Professional Software, Inc. GrafTalk is a trademark of Bentley Group, Inc. Graphwriter is a trademark of Graphic Communications, Inc. uGRAF is a trademark of Transpacific Data Systems, Inc.

THE BEST STANDS OUT



- * **PRACTICAL DECISION-MAKING**
aids buy/hold/sell decisions by projecting cash flow & profitability; computes ROI, IRR, ROE, and FMRR.
- * **REALISTIC SIMULATIONS**
models economy based on 5 separate components of inflation for realistic "what-if" studies
- * **UP-TO-DATE WITH CURRENT MARKET**
takes into account rent control, runaway inflation, money rates, creative financing, and complex lease packages
- * **UP-TO-DATE WITH TAX LAWS**
includes latest tax laws for depreciation (including ACRS), recapture, & capital gains
- * **PROFESSIONAL PRINTOUTS**
detailed 10-year tables of cash flow and ROI in personalized, paginated report format
- * **ERROR TOLERANT**
designed for ease of use by newcomers to computers; fully tested by real estate professionals
- * **INSTRUCTIVE MANUAL**
100-page book includes easy-to-follow examples and detailed instruction in investment analysis

The best investment clearly stands out when you use computer-aided decision-making with the Real Estate Analyzer by HowardSoft. Applying the latest techniques in investment analysis, this software produces detailed, objective projections of cash flow and overall investment return for any commercial or residential property. Even the most dissimilar deals are compared fairly because inflation rates, creative loan packages, complex depreciation schedules, involved leases, and complex tax laws are all taken into account.

for all Apple and IBM-PC Computers
at your local dealer



Howard Software Services
for the SERIOUS Personal Computer User

8008 Garand Ave. Suite 310 La Jolla CA 92037 (619) 454-0121

REVELATION



NOW THERE IS ONLY ONE RELATIONAL DATA BASE MANAGEMENT SYSTEM IN THE MICROCOMPUTER UNIVERSE—REVELATION. BY COSMOS.

We dare you to compare the power and versatility of Revelation's integrated approach in data base management. Revelation features: A superior program and applications generator • A powerful, user-friendly procedural language • Data and program communications link with compatible mini-computers • Print buffer • Report generator • Interactive line editor • Variable length records, files and fields • Integrated 8087 math chip support • Menu driven

Revelation co-exists with MS/DOS™ or PC/DOS™ and is compatible with the IBM PC™, XT™, COMPAQ™, Corona™, Columbia Multi-Personal® and Eagle 1600™. Also compatible with minicomputers utilizing the PICK Operating System™. Minimum configuration requires 320K memory and 8087 math chip.

123 Ferntree Drive W.
P.O. Box 4H
Morton, WA 98356

COSMOS

CIRCLE 137 ON READER SERVICE CARD

(206) 496-5974
24-hour answering
service: (206) 226-9362

MS/DOS™
© Microsoft Corp.
IBM PC Registered
TM of International
Business Machines Corp.
COMPAQ™ TM of COMPAQ
Computer Corp.
PICK Operating System
TM of PICK SYSTEMS
Eagle 1600™ TM
of Eagle Computers
Corona PC™ TM of
Corona Data Systems
Columbia Multi-Personal®
TM of Columbia Data
Products Inc.

How to get top-quality printing for your IBM PC.

Without paying top dollar.



Qume's SPRINT 11 PLUS[®] is the smartest choice in a letter-quality printer for your IBM PC. It's made by one of the world's largest suppliers of daisy-wheel printers, it offers the highest reliability in the industry, and its print quality is second to none. All this, for *substantially less cost* than any printer in its class. The SPRINT 11 PLUS plugs right into your PC, prints at 40 cps—equivalent to 360 words per minute—and works beautifully with your IBM PC business software. Including sophisticated word processing packages. So don't take chances on a low-performance printer. And don't spend more than you need to. Choose the dependable, premium-quality SPRINT 11 PLUS from Qume. It's the best printer you can buy for your IBM PC.

And the best buy in printers. For full details on the SPRINT 11 PLUS, contact one of the convenient Qume distributors listed. Qume Corporation, 2350 Qume Drive, San Jose, California 95131.

Qume.
A Subsidiary of ITT

For your best
investment in printers.
Call your nearest Qume distributor today.

United States:

American Calculator & Computer
(206) 933-2344—AL
Anacom (206) 881-1113—CA, UT, WA
Anthem Systems (415) 342-9182—CA
Bohling & Associates (612) 922-7011—MN
Butler Associates (617) 964-5270—CT, MA
Byte Industries
(800) 972-5948 (CA Only)
(800) 227-2070 (Outside CA)
David Jamison Carlyle
(800) 421-3522 (CA Only)
(800) 352-3522 (Outside CA)
CA, CO, HI, IL, NJ, TX
Computers & Peripherals Int.
(315) 476-6654—NY
Datamite (406) 727-4422—MT
The Datastore (609) 779-0200—NJ
Data Technology Industries
(415) 638-1206—CA
Equipment Resources (404) 955-0313—GA
Gentry Associates
(800) 859-7450—FL, GA, LA, NC, SC, TN
Inland Associates (913) 764-7977—KS
InterACT Computer Systems
(704) 254-1949—FL, GA, NC
Kierulff Electronics
(800) 338-8811—AZ, CA, CO, CT, FL, GA, MA,
MD, MN, MO, NC, NJ, OH, OK, TX, UT, WA, WI
MicroAmerica Distributing
(800) 431-7650 (MA Only)
(800) 343-4411 (Outside MA)—CA, TX
Midwest Microcomputers (419) 762-1115—OH
National Computer Syndicate
(312) 459-6400—IL, MN
Pacific Mountain States (213) 989-6113—CA
PCA Microsystems (512) 654-4711—TX
PCS, Inc. (214) 931-1276—TX
Pioneer Electronics
(216) 567-3600—AL, CT, FL, GA, IL, IN, MA,
MD, MI, MN, NC, NJ, NY, OH, PA, TX
R. C. Data (408) 946-3800—CA
ReAction Office & Computer Svcs.
(916) 972-9729—CA
Rudor Communications (212) 245-5509—NYC
Schweber
(800) 645-3040—AL, CA, CT, FL, GA, IL, IN,
MA, MD, MI, MN, NJ, NY, OH, OK, PA, TX, WI
Southern Microcomputer
(305) 621-4237 FL
Spectrum (800) 527-0790—TX
Tek-Aids Industries
(312) 870-7400—IL, PA, TX
Terminals Rentals (714) 832-2414—CA
Terminals Unlimited
(800) 336-0423—24 Locations
Tricom (516) 881-1222—NY
Unico (512) 451-0251—TX
Victor Electronics (617) 481-4010—CT, MA
Western New York Computer
(716) 381-4120—NY

Canada:

Abacus Data Services
(416) 677-9555—Ontario
DataTech Systems
(604) 479-7117—Alberta, BC, Ontario
Data Terminal Mart
(416) 677-0154—Alberta, BC, Nova Scotia,
Ontario, Quebec
Future Electronics
(514) 697-7710—Alberta, BC, Ontario, Quebec
Micro Distributing (604) 464-5634—BC
Printerm Data (416) 977-1711—Ontario

Qume
A Subsidiary of ITT

memory in one piece. This feature may be an important one to consider if you plan to build very large programs. If so, then the UCSD Pascal language may be your only choice.

UCSD Pascal also provides concurrent processes. A "concurrent process" is a program that executes side-by-side with another program. For example, you might want to write a program that prints the contents of a file while another program does word processing (on another file, say). The print program is called a "spooler" and it executes in short bursts in between the times the word processing program is executing. Both programs execute in short bursts; first one and then the other. The spooler and the word processor programs are part of a system of (two) concurrent processes.

UCSD Pascal provides a way for you to write concurrent programs. In this sense, UCSD Pascal is a better language to use for systems programming than IBM Pascal. In fact, if you want to learn more about concurrency in computer systems, then use UCSD Pascal.

Both languages exceed the ISO standard for file processing. A "direct access file" is a file containing data that can be directly accessed in one "seek" to the disk. This is essential in most data processing applications.

IBM Pascal includes extensions to ISO Pascal for doing systems programming. In particular, IBM Pascal includes bit-level data types "byte" and "word" that let you access binary-encoded cells in memory. Other data types allow you to control the memory segmentation register of the 8088 processor end so forth. These features "break down" the strong typing of Pascal so that you can do mixed-type operations on memory.

UCSD Pascal allows you to compress your data into the smallest possible memory space. The "packed" attribute causes data to be "squeezed" into memory in the most efficient way possible. IBM Pascal, on the other hand, does not pack data. Remember, the goal of IBM Pascal is to be fast and efficient. If you want packed data, then you must pack it yourself using the system level data types.

UCSD Pascal provides an EXIT procedure that lets you break out of a procedure or program before reaching the end of the procedure or program. This is a kind of "early termination" intrinsic that comes

in handy in structured programming.

If you are not used to programming without GOTO statements then the veri-

UCSD PASCAL
*allows you to compress
your data into the
smallest possible
memory space.*

ous forms of exits found in IBM Pascal will interest you. These are summarized below.

BREAK—leave a loop or decision path before it has completed the entire pass.

CYCLE—skip to the end of the loop and then start at the beginning of the loop continuing with the next iteration.

CASE-OTHERWISE—if all choices in a case statement fail, then do the OTHERWISE clause of the case statement.

Language Limitations

Figure 3 summarizes some of the more important limitations of IBM Pascal end UCSD Pascal.

UCSD has a limited form of "long integer" that lets you process integers with up to 36 digits. IBM Pascal, on the other hand, provides "long integers" in the range of 0 to 65535. These are called "words."

UCSD Pascal runs on top of one or two optional simulators. The "SYSTEM4" simulator supports 16-digit precision real numbers. The "SYSTEM2" simulator end IBM Pascal language support 7-digit real numbers.

IBM Pascal L-strings can be up to 255 characters in length. The fixed-length strings can hold up to 32,767 characters. The maximum size of records, sets, and enumerated scalars is not defined in the IBM Pascal language.

You can use identifiers of nearly any length (as long as they fit on a line) in either language. The first 8 characters are the only ones that UCSD Pascal looks at, while the first 31 characters must be

unique in the IBM Pascal language.

The underscore character is allowed in both languages, but it is ignored in the UCSD Pascal System. For example, `RECNUM` is treated like `RECNUM` by UCSD Pascal.

There are other limits unique to each language that you will encounter as you learn more about Pascal programming for the IBM Personal Computer.

In general, if you are concerned with speed of execution, systems-level programming, and portability is not especially important, then the IBM Pascal language is probably your choice.

If, on the other hand, you want portability, ease of use, graphics or sound, and you are not concerned so much with speed of execution or getting to the bits in main memory, then UCSD Pascal is probably a good choice for you.

This book will present examples of both programming languages. The parts of the languages that differ significantly will be treated in separate sections of the same chapter. This way you can pick and choose which dialect you want.

What Is a Pascal Program?

A "source program" is a collection of data descriptions and executable instructions written in a "form" that the Pascal compiler can translate into machine language. In this chapter we will learn the rules of acceptable "form" that the Pascal compiler expects you to follow. As you may know, this is called the "syn-

tax" of Pascal.

It is also important for you to know what a Pascal statement means. In other words, you should learn the "semantics" as well as syntax of the following rules. The semantics of Pascal will be shown through numerous examples taken from actual Pascal programs.

A Pascal program is a "program heading" followed by a semicolon, followed by a "block," and terminated by a period. The simplest Pascal program that you can write is shown below.

```
program EXAMPLE;  
begin  
end.
```

The Program Heading

Note that the first line contains the "program heading." It consists of the "reserved keyword," `program`, followed by an "identifier" that is chosen by you. In the example, the "program heading" contains the word `EXAMPLE` as the name of the program. This name must begin with a letter of the alphabet, contain either letters, numerals, or the underscore character, and consist of 31 or fewer characters (all characters beyond the first 31 characters in a name are ignored).

The reserved keyword, `program`, is one of many keywords that are used by the Pascal compiler and so cannot be used as a name by you. Consult Figure 4 for a complete list of the reserved words in Pascal, and Figure 5 for a list of other words that are used by the IBM Pascal compiler. To be safe and sure, use words other than the ones in Figures 4 and 5 as names in your programs.

You can translate `EXAMPLE`, in the above program, into machine language that will run on your IBM Personal Computer. Use the steps explained earlier to do this. Of course the resulting machine

KEYWORDS
*that are used by the
Pascal compiler cannot
be used as a name by
you.*

language program is not very interesting because it has no inputs, outputs, or instructions that do anything! But the program is entirely correct.

Notice the semicolon that follows the "program heading," and the period that follows the program "block." These are two very important punctuation marks in every Pascal program.

The semicolon character is the statement separator in Pascal. It is used to concatenate two or more statements. Concatenation means "to join together", and this is exactly what the semicolon character does in Pascal. You will use semicolons in many places in a Pascal program, but they always mean the same thing: concatenate two statement parts.

In this case we have used the semicolon to concatenate the "program heading" with the program "block." The "block" is sometimes called the program "body."

Figure 3: Language Limits

	IBM	UCSD
Max integers	-32,767..32,767	-32,767..32,767
integer word	-32,767..32,767	-32,767..32,767
long	0..65535	
Max reals	7 digits to E ± 38	up to 36 digits
String lengths	0.255 and 1..32,767 characters	16 digits to E ± 308 1.255 characters
Array size	1..32,766 bytes	1..32,766 bytes
Set size	?	1..4080 elements
Identifiers	recognize up to 31 characters	recognize up to 8 characters

NEW ENGLAND'S HIGH TECH WAREHOUSE...SHOP AND SAVE

1-800-000-0000

IBM PC SOFTWARE

BUSINESS	
ADDITION/DATE	\$ 487.75
alpha II	\$ 29.00
CENTRAL POINT Copy II PC	\$ 224.75
US Reporter II	\$ CALL
LOSTUS 1.2.3	\$ 201.75
MICROPHOTO Monitor	\$ 185.00
MICROSOFT Multigun	\$ CALL
SOFTWARE ARTS	
TK Server	\$ 93.95
SOFTWARE PUBLISHERS	
PFS: File	\$ 83.75
PFS: Report	\$ 83.75
PFS: Organ	\$ 100.00
FORCUM SuperCalc	\$ 182.75
VISCORP Visucalc	\$ 220.75
Visuwrite	\$ 280.00

ENTERTAINMENT, HOME & EDUCATION

AUTOMATED SIMULATION	
Temple of Alpha	\$ 29.00
CONTINENTAL Home Accountant	\$ 51.50
INFOCOM Zork II & III	\$ 30.75
Deadline	\$ 33.50
Supersand	\$ 53.50
MICROSOFT: Flight Simulator	\$ 34.00
PEACHTREE Peachtree 5000	\$ 240.00
SPRINKLER Face Maker	\$ 24.75
Story Machine	\$ 24.75

DISKETTES & STORAGE

MEMOREX	
10 each 5 1/4" - \$55.00	\$ CALL
10 each 5 1/4" - \$55.00	\$ CALL
10 each 5 1/4" - \$55.00	\$ 15.95
10 each 5 1/4" - \$55.00	\$ 26.95
10 each 5 1/4" - \$55.00	\$ 25.95
10 each 5 1/4" - \$55.00	\$ 26.95
LIBRARY CASE 5 1/4"	\$ 3.50
DISK BANK 5 1/4" - microdot 5 record	\$ 21.95
ORD. FILE 5 1/4" - Elephant "Trunk"	\$ 21.95

MODEMS

ANCHOR AUTOMATION	
Sigmanet Mark I	\$ 83.00
HAYES	
Smartmodem 300	\$ 211.00
Smartmodem 1200	\$ CALL
Smartmodem 1200C	\$ 445.00
NOVATION	
OC-CAT	\$ 188.00
J-CAT	\$ 115.00



COLUMBIA PC 1600

THE ENHANCED IBM ALTERNATIVE TRULY IBM COMPATIBLE

IBM Hardware & Software compatibility in a Multi-User 15 M computer 128K two serial ports, one parallel port and 5 expansion slots. Runs MS-DOS, CP/M 86 or MP/86. OS/2-16 MS-DOS "Super-Pak" includes Macro-Assembler, Diagnostic, Basic, & colorgraphics. PLUS Perio View, Speller, Calc and Fast-Draw. Graphics, Speech Commanders & Home Accountant \$ CALL

MISCELLANEOUS

ANTI-STATIC TOUCHMATS	
SMART-Joystick	\$ 89.00
Patches	\$ 40.00
Patches	\$ 35.00
T & G PRODUCTS	
Zytronic	\$ 43.00
Trax-600	\$ 47.00

DRIVES

TEAC HALF-HIGH/1/2 350K DRIVES
FD 588 5 1/4" - IBM compatible dual two in one
8001 Low power drain OS DD
High reliability \$ 279.00

QUAM

QUAM'S SUPERIOR HALF-HIGH/1/2 350K DRIVE
QUAM TRIM, 142 features Ceramic RW Head Positioner, Advanced Steel Head, Heat Positioner IBM Compatible \$ 249.00
TANDON TM 100-2 350K Drive \$ 239.00
"SLIM-LINE" TM50-2 \$ 259.00

HARD DISK DRIVES

QVING SYSTEMS
Can be internal. Complete package includes drive, power supply, software and documentation. 5 1/4" or 10 1/2" 15 meg \$1015.00

COLUMBIA VP PORTABLE



128K, 2 350K Slim Line Drives, 9" Monitor (Amber or Green) comes w/MS-DOS Super-Pak (as described in Columbia PC-1600 section). Serial & Parallel Ports 15 x 16 x 6 x 6 x 6 x 6
Weights 32 lbs \$ CALL

PRINTERS



STAR MICRONICS	
Gen-10K	\$ CALL
C-ITON	
Printer 1 per	\$ 379.00
Printer 1 per	\$ 449.00
EPSON	
FX-80 FX-100	\$ CALL
MANHEIM TALLY	
MT-100	\$ CALL
MT-160	\$ CALL
OKIDATA	
82A	\$ 419.00
53A	\$ 706.00
54 per	\$1055.00
52 per	\$ 579.00
53 per	\$ 827.00
LETTER QUALITY	
C-ITON	
Stamper F-10-40 per	\$1179.00
JUNI 1100, 1400P	\$ CALL
NEC	
2550 IBM plug-in	\$1636.00
TT-201A, Pin 5 ribbon feed, ser & par interface	\$ 515.00

MONITORS



GORILLA	
Green H-Res	\$ 89.00
300 Amber	\$ 155.00
300 Green	\$ 129.00
315K including cable	\$ 179.00
Color I computer	\$ 299.00
Color II RGB IBM compatible	\$ 429.00
NEC	
1201 H-Res	\$ 159.00
1203 RGB (IBM compatible)	\$ 429.00
1205 H-Res Amber	\$ CALL
Amber	\$ 129.00
Green	\$ 119.00
Amber H-Res	\$ 149.00
QUADRAM	
Quadchrom RGB	\$ 499.00

IBM HARDWARE

KEY TRONIC, INC.
Enhanced Word Processing Keyboard Model KB-5150
Familiar key placement for touchtypists. Key legends instead of obscure symbols \$ 199.00

QUADRAM CORPORATION
QUADBOARD Multifunction Board
Full compatibility from 64K to 256K
Parallel Printer Port, Asynchronous RS232C Serial Modem Port
Programmable Clock/Calendar RAM Disk Drive (software)
64K starts at \$ 299.00

MICROFAX Printer Spooler
Print Buffering from 4K to 612K
Any Printer/Computer Combination
Why not on your printer?
Prices start at \$ 129.00

QUADCOLOR IBM Color Card \$ CALL
QUADCOLOR 8 640 by 300 \$ 229.00
QUADCOLOR 8 640 by 400 \$ CALL
QUADLINK \$ CALL

STS SYSTEMS "SUPER RIO" CARO
The Truly ultimate IBM 486-in-Eight+ Functions on one card
• 4x256K (768K w/ser "Poppytail" card)
• Two RS232 ports, one parallel
• Clock/calendar • Game Port • Parallel cable
• Printer Buffer • RAM disk • Serial cable \$ CALL

3M MULTISPLAY CARO
IBM monochrome support color graphics support 8 pin print or adaptor all on a single expansion card \$ CALL

PLANTYONICS
COLORPLUS \$ 399.00

**WAREHOUSE
SHOW ROOM
OPEN TO
THE PUBLIC**
8 am to 6 pm M-F
10 am to 4 pm Sat.



CENTENNIAL
Computer Products, Inc.
561 E. Industrial Drive
Manchester, New Hampshire 00000

TERMS AND CONDITIONS

* NO CREDIT CARD FEE * Personal checks (allow 10 days to clear). Visa, MasterCard, wire transfers, include telephone number * COD orders accepted - \$300 maximum - \$10 non-refundable surcharge * All products factory sealed with manufacturer's warranty * PO accepted from qualified customers * Approval needed on all returns * 10% restocking charge unless defective plus shipping * Shipping Handling Insurance \$5.00 minimum, 4% UPS ground, UPS Blue Label 189 quoted at time of order * All prices subject to change without notice * Telephone Order Desk Hours 5 AM to 5 PM, Monday through Friday, 10 AM to 4 PM Saturday, Eastern Standard Time

**NATIONAL
ORDER DESK**

1-800-000-0000

**IN NEW HAMPSHIRE
PLEASE CALL**

000-000-0000



For complete selection of software and accessories for the IBM/PC and compatible computers.

ORVX SYSTEMS

QUALITY DISCOUNTS

SOFTWARE

Accuprice Corp.	
Creative Graphics	\$112
Alpha Software	
Data Base Manager II	\$195
Mailing List	72
Executive Package	105
Type Faces	99
Question	35
Apple - IBM	
Connection	130

Compuview	
Vedit 8086 CPM 86	\$180
Vedit MS DOS	130
Condor III	\$445
Continental Software	
The Home Accountant	\$ 99
1st Class Mail	88
Property Management	350
Decision Resources	
Chartmaster	\$310
Denver Software	
Easy (Exec Acc't Syst)	\$499

Harvard Associates	
PC Logo	\$185
Hayes	
Smartcom II	85
Hi Tech	
Computer Services	
Pascal Toolkit	\$129
Scientific Supp Pak	77
Information Unlimited	
Easysaver II	\$209
Easy Speller	120
Easy Filer	230
Accounting Module	379

ICR - Future Soft	
QuickPlot	\$299
Innovative Software	
T I M II	\$345
Real Graphs	249

Laboratory Microsystems	
Intel 8087 Systems	\$ 80
Fort Cross Computers	250

Lexisoft	
Spitfinder	\$259
Lifetree Software	
Volunteer	\$135

Lotus 123	
NPPI Ltd.	
Soft Lock	\$ 85

Mark of the Unicorn	
Mince	\$154
Final Word (WP)	239

Melsoft	
Benchmark Word Pro	\$ Call
Benchmark Mail List	\$ Call

Micro Decision Systems	
Merge Calc	\$ 99
Load Calc	85
Discalc	85

Microlocus	
Color Level II	\$1250

Micro Pro	
WordStar	\$ Call
Infostar	\$ Call
Pak (MS/MS/MS/MS)	\$ Call

Microsoft	
Multiplan/MS	\$199
Multiplan/MuStar	240
MS/DOOS	\$325

Business Basic	
Compiler MS/DOOS	460
MS Pascal Compiler	375
C Compiler	275
Basic Compiler	295
Multiplan	175

Microstud	
Cross Talk	\$135
Norell System-Backup	\$ 42

North American	
Answer	
(Database Prog)	\$169

Memory Shift	79
Northwest Analytical	
Stat Pak	\$365
Oasis	
The Word Plus	\$120
Punc & Byte	99
Organic Software	
Textmaker II	\$101
Misestone (128K)	229
Datebook	229

Peter Norton Utilities	\$59
-------------------------------------	------

Star Edit	180
Desk Edit	80
Basic Compiler	225
Fortran IV PC/DOOS	
or 8086	209
8087 Support	40
Diagnostics II	89
Optimizer	149
Personal Data Base	99
Investment Tax Pac	160
Scratch Pad	219
Systems Plus	
Landlord (prop mgmt.)	375

d-BASE II CORNER

Ashlon-Tets	
D Base II	\$ Call
Bottom Line Strategist	299
FPL	475
Friday	225
Human Soft	
dB Plus	\$ 99
Fox & Geller	
Quick Code	\$225
D UII	69
Software Banc	
d Base II User's Guide	\$ 15
wd d Base II Purchase	20
Anderson-Bell	
Abstar	\$349
Tylog Systems	
d Base Window	\$206

Aspen Software	
Grammatic	\$ 60
Proofreader	42
Bible Research Systems	
Word Processor	\$159
BPI	
Personal Accounting	\$161
Byrom Software	
BSTAM (micro to Micro)	\$149
BSTM (Micro to Main)	
149	

Cdex	
Training Program for Visicalc	
WordStar, SuperCalc 2, EasyWriter II Series	
Each	\$ 52
Managing Your Business With Lotus 1-2-3, Multiplan, Visicalc, SuperCalc 2 Series	
Each	52
d-Base II Training	52
Program	
IBM PC DOS 2.0	52
Training	52
Central Point	
Copy II PC	\$ 34

Digital Research	
Concurrent CPM 86	\$225
CPM 86	50
Cobol 86	499
Pascal MT + 36 w/SP	375
SPR 86	150
SID 86	113
C Basic 86	135

Dow Jones	
Market Analyzer	245
Market Manager	219

Eagle Software	
Money Decisions	\$129
Eco-Soft	
Microstat	\$230

Emerging Technologies	
Edo editor	\$150
Words (Reformatter)	150

Graphic Software	
Super Chartman II	299
Super Chartman IV	199
Both	350

Financier Inc.	
Financier Personal	\$119
Tax Series	105



PEACHTREE CORNER

- PeachTree 5000 Personal Productivity System. Includes PeachText Word Processor, Random House Electronic Thesaurus, Spelling Proofreader, PeachCalc Electronic Spreadsheet and List Manager. FREE One box of Washburn's "Desknotes". BONUS A coupon to get Access Pak (Retail for \$50) for only \$10.00. All of the above for only
- PeachPak & General Ledger, Accounts Receivable, Accounts Payable) does not support hard disk
- General Ledger, Accounts Payable, Accounts Receivable, Sales Invoicing, Inventory Control
- Peachtree Graphic Language
- Peachtree Business Graphics System

PBL Corp.	
The Personal Investor (128K)	\$149

Satellite Software	
Personal Word Perfect	\$149
P-Edit	75
SSI Forth (w/Source code)	75

Scientific Mkt.	
Market Fax	\$ Call

Software Arts	
TKI Solver	\$219

Software Publishing	
PPS Report	\$ 94
PPS File	99
PPS Graph	\$ 99
PPS Write	99

Sorcim	
SuperCalc II	\$179
Spell Guard	129
Super Writer	179

Star Software Systems	
Legal Timekeeping	\$179
Billing & Accts.	\$787

Supersoft	
C Compiler-8086	\$350

Runtime Basic (req'd for above)	45
--	----

Visicalc	
Visicalc	\$179
VisiSchedule	229
VisiWord	299
Business Forecasting Models	85

Wool Software Systems	
More II PC to Cpm	\$109
EPC to PC	109

... and many more.	
--------------------	--

GAME

Automated Simulation, Amnok, Avalon Hill, Blue Chip, Broderbund, Data Most, Infocom, On Line, Spinnaker Software, Sierra-On-Line, Sublogic, etc.,

BOARDS

AST Research

ComboPlus 64K Clock/
Calendar, Serial & Parallel,
iF, Expandable to
256K \$267
MegaPlus 64K Clock/
Calendar, Serial Port,
Expandable to 512K
w/Megapack 287
Extra ports available for
Megapack and iO Plus II
Includes Game, Parallel &
Serial 40

Sensilar Memory Card
— 3 modules cap. 194
Sensilar Multifunction
Card — 6 modules
capacity 93
Sandstar Modules \$ Call

Quadram

Quadboard 64K, Clock/
Calendar, Serial &
Parallel Ports,
Software \$269
Microfazer Stack Printer
Buffer (expandable to
512K)
• Parallel/Parallel BK 145
• Parallel/Parallel 64K 188
• Serial/Parallel BK 170
• Serial/Serial BK 170

COMPLETE SYSTEM CORNER (w/Full Support)

Includes: Star Micronics Gemini 10X Printer, Hi-Res Green
Monitor, Cables, iF, etc....
System A: Corona Desktop PC-2, (2) 320K Drives, 128K Memory
Hi-Monitor, Graphics, Serial/Parallel Interfaces,
MS-DOS, GW Basic, Word Processing and PC Tutor
Software \$ Call
System S: As above, but portable \$ Call
System C: As above, but with 10 MB hard disk instead of
second drive \$ Call
System D,E,F: Columbia similar to above configuration, but
Includes Super 3000 Software Pak \$ Call

Megapack 256K upgrade for
Megapack \$ Call
iO Plus II Clock/Calendar
and Serial Port 116

BYAD

SYAD DS-II
(64K, 230, CPIM) \$599

Maynard Electronics

Floppy Drive Controller \$165
Floppy Drive Controller
w/Parallel Port 229
w/Serial Port 240

QuadLink 64K Memory,
Game port allows
Apple Software to
run on ISMP/C 559

Tecmar Products

Xedex/Microlog
Baby Blue \$475

Tall Tree

512K JRAM Mem. Board \$699
512K JRAM Mem. Board \$699
US Robotics Auto-Link
Auto answer
300/1200 379
US Robotics Password 395

DISPLAY CARDS CORNER

Hercules Graphics Board \$369
Orchid Monochrome Graphic Adapter 432
Plantronics Colorplus 389
USB Display Card (color/monochrome) \$ Call
Amdek MAI Card \$ Call
Tecmar Graphic Master \$ Call

TELECOMMUNICATIONS CORNER ***SPECIAL***

Hayes Smartmodem 1200/Hayes Smartcom II Software
AST iO Plus II Clock/Calendar and Serial Port \$695
Above w/Smartmodem 300 415
Hayes Smartmodem 1200 & Smartcom II Software 579

MONITORS

Amdak Video 300A
Amber \$180
Amdak RGB Color II 495
NEC 12" Hi-Res Green 167
Sanyo 12" Hi-Res Green 196
NEC Hi-Res 12" Amber 169
NEC JB-1280 Green 119
PDS RGB Color \$ Call
NEC JC-1203 RGB 725
Quadram Quadchrome, \$ Call
Texas 12" Amber
Monitor 148
Texas 12" Green 136
Texas 12" Medium RGB 323
Texas 12" High RGB 512
Texas RGB Cable
for PC 17

MODEMS

Hayes Smartmodem
300 \$205
Hayes Smartmodem
1200 509
Hayes Chronograph 189
Newtong 212 Auto-Call
US Robotics Auto-Link
(full auto 300/1200) 459
US Robotics Auto-Link
Auto answer
300/1200 379
US Robotics Password 395

DISK DRIVES

Tandon TM-55-2 \$275
Tandon TM-100-2 240
Datsun DS-501 Hard \$ Call
Datsun DS-512 Hard \$ Call

DISKETTES

3M 5" DS DD Box \$ 40
BASF 5" DS DD Box 37
Maxell 5" DS DD 40
MDI Box 35
Verbatim 5" DS DD Box
Ultra Magnetics 5" DS,
DD, Bonus Box
(12 diskettes) 35

PLOTTERS

Enter P100 Sweet P 599
Panasonic Digital
Plotter \$ Call
Strobe M100 Plotter
(PS 232) 496

PRINTERS

C. Itoh Startwriter 1,350
C. Itoh Prowriter 8510 425
C. Itoh Prowriter 1550 725
NEC 3550 \$ Call
NEC 8023A 475
Olivetti Microline 82A 399
Olivetti Microline 92 675
IDS Priem 80
(w/4 options) 1,399
IDS Priem 132
(w/4 options) 1,547
IDS MicroPrim 565
Silver Reed
Daisy Wheel \$ Call
Star Micronics
Gemini 10X 325
Star Micronics
Gemini 15 489
GE Printers \$ Call
Epson FX-80 509
Transfer T-130-P 725
Transfer T-315P Color 519
Mannesman Tally
M1150 475
..... and much more.

Miscellaneous

Kodak Technologies
Graphic Tablet
w/Software \$ 96
Curtis PC Products \$ Call
Electronic Protection
Services \$ Call
Syntac Light Pen 140
TG Joystick 49
Kraft Joystick 56
VersaWriter Tablet 259
Keytronic WP Keyboard
Mouse Systems
PC Mouse 229

ORYX SYSTEMS Inc.

CIRCLE 351 ON READER SERVICE CARD

Prices:

- Wisconsin residents — add 5% for sales tax.
- Add \$3.50 for shipping per software and light items
- For multiple and other items, call.
- Foreign — add 15% handling & shipping for prepayment (Int'l money order)
- Prices subject to change without notice.
- All items subject to availability.

Store prices are strictly retail.

We welcome:

- Visa, MasterCard & American Express — (Add 4%)
- Checks (Allow 1-2 weeks for clearing)
- COD (Add \$2.00 per shipment — Cash or certified check required)

Working Hours: Mon-Th 8:30 - 5:30 • Fri 8:30 - 6:30 •
Sat 10:00 - 2:00 • Central Time

For technical information
& in Wisconsin: 715-848-2322

ORYX SYSTEMS, INC.

205 Scott St. • P.O. Box 1961
Wausau, WI 54401

— Int'l. Telax —
260181 ORYX SYS WAU

ORDER TOLL FREE OUTSIDE WISCONSIN 1-800-826-1589



because this is where the instructions to be carried out belong.

The Program Body

The begin-end pair in the sample program above encloses Pascal statements

NAMES OF
constants can be up to
31 characters in length,
just like the names of
programs.

that perform actions when your program is run. This is where the "executable part" of your program goes. Input, output, addition, subtraction, comparing values, and all actions performed by your program are placed in a certain order here.

The "block" of a program actually contains a *data* section and an executable part section. The begin-end pair enclose the executable part, but other Pascal statements may optionally appear in the "block" before the begin-end pair. These other statements define the data that is to be processed by the begin-end pair. Here is another example, showing a *data* part.

```
program SAMPLE;  
  const A = 5;  
        B = -10;  
begin  
end.
```

In this example, *SAMPLE* is a program that contains two numbers, *A* and *B*, and nothing else (not even an executable instruction). The numbers are given names (*A* and *B*), and values (5 and -10). Furthermore, the reserved keyword, *const*, is used to declare *A* and *B* as "constants". A program "constant" in any positive or negative number, or string of characters that never change during the life of the program. That is, *A* is always 5 and *B* is always -10 in *SAMPLE*.

Constants are given names in the *const* statement. Names of constants can be up to 31 characters in length, just like the names of programs. The first character must be a letter of the alphabet, and the subsequent characters must be either let-

ters, numerals, or the underscore character. Here are some constants.

```
A12  
END-OF-THE-MONTH
```

Here are some incorrect names that you should not use.

```
$BILLS  
BILLS  
N%
```

These are incorrect because \$ and % are not letters of the alphabet, numerals, nor an underscore.

Simple Output

Obviously, the previous two examples are of little use because they contain null begin-end executable parts. What is needed is a way to get information in and out of a program, and process the information in between.

Figure 5 lists words that are used by Pascal to do certain common things. Input and Output are among those words, because every useful program frequently requires them.

In order to do output from your program to the screen of your Personal Computer, you must use the predeclared word *output* in the program heading, and then use predeclared "intrinsic procedures" *write* and *writeln*. Here is an example that you can run on your Personal Computer.

```
program SCREEN (output);  
begin  
  writeln ('Test program  
  SCREEN');  
  write ('A one-line prompt');  
  writeln  
end.
```

This program has many interesting features to discuss. Suppose we begin with the program heading and work our way through it one statement line at a time.

program SCREEN (output);

The program is given the name *SCREEN* by the author and since it is going to display some information on the screen, the predeclared word *output* is included in the program heading. The word *output* is enclosed in parenthesis because the syntax rules of Pascal require parenthesis to separate the name *SCREEN* from the name *output*.

The program heading still requires a semicolon between it and the program

block. This tells the translator to expect a block to follow the heading. Remember that the semicolon means to join together or concatenate two parts of a program. *begin*

This program has no data! It simply outputs two messages and then it stops (we say it "terminates execution"). However, the syntax rules of Pascal require that all executable statements be enclosed inside a begin-end pair.

Writeln ('Test program SCREEN');

This is an example of a Pascal "intrinsic procedure." Here *writeln* is the name of a built-in program that is provided by Pascal to perform the task of displaying a line of information on the output screen. The purpose of *writeln* is to display the values listed between the parenthesis that follow *writeln*.

When program *SCREEN* is translated and then run, it "calls" the intrinsic procedure *writeln*. In turn, *writeln* displays the message given in parenthesis:

Test program SCREEN

Note how we instructed *writeln* to display this information. The single quote marks are used in Pascal to denote a "string constant". A string constant is a string of characters.

The string constant is displayed on the screen at the current screen cursor position. Thus, "Test program SCREEN" will appear on the screen wherever the screen cursor happens to be when the program is run. After the message is displayed, the cursor is moved to the next line following the message. The way in which the screen cursor is moved to the next line is very important, and you should pay careful attention to the difference between *write* and *write* as illustrated in the next statement line.

write ('A one-line prompt');

Notice the semicolon following the previous statement line and this statement line. The semicolon means to "join together," hence the two output statements are concatenated.

This is an example of another intrinsic procedure that outputs the message:

A one-line prompt

This message is output on the line immediately below the previous message. The two statements cause the screen to contain

Figure 4: IBM Pascal Reserved Words

Standard Pascal	if	to	implementation
and	in	type	interface
array	label	until	module
begin	mod	var	otherwise
case	nil	while	public
const	not	with	pure
div	of		readonly
do	or	IBM Pascal	return
downto	packed	adr	static
else	procedure	ads	super
end	program	break	unit
file	record	cycle	uses
for	repeat	enter	value
function	set	external	vars
goto	then	forward	xor

Figure 5: IBM Pascal Pre-Defined Identifiers

These names may be re-defined by the programmer, but once they are re-defined, they no longer have the meaning given by the IBM Pascal system.

Standard Pascal	rewrite	IBM Strings	IBM I/O
arctan	round	concat	assign
ebs	sin	copylst	close
boolean	sqr	copystr	discard
char	sqr	delete	filemodes
chr	succ	insert	readln
cos	text	posin	readset
dispose	true	scaneq	sequential
eol	trunc	scanne	terminal
eoln	unpeek		
exp	write		
false	writeln		
float		IBM System	IBM Miscellaneous
get		filc	PCBFQQ
input		filsc	maxword
integer		movel	word
in		movar	wr
maxint		mover	lstring
new		movesl	null
odd		retype	string
ord			{ }
output			{**}
pack			!
pred			
put			
read			
readln			
real			
reset			

PUZZLED ABOUT EMULATORS?



SMARTERM™/PC
is the piece you need!



Thousands of users find our software emulators offer more multiple setups, "softkeys", full printer support, powerful ASCII and binary file transfer including "error-free" mode. Combined with a complete manual, reference card, keypad chart, and unlimited telephone support, these features make SMARTERM/PC unmatched! Also for IBM-XT, Columbia® and Compaq®. Call NOW for more information.

Available through your local computer dealer or directly from

Persoft, Inc.

2740 Ski Lane
Madison, WI 53713 (608) 233-1000

Software for Professionals...
by Professionals

SMARTERM is a trademark of Persoft, Inc.
VT is a trademark of Digital Equipment Corporation
Dasher is a trademark of Data Design Corporation

ANNOUNCING AN INNOVATION IN TYPING INSTRUCTION.

FUN.

Now PC owners can learn keyboard skills like never before, with MasterType.

MasterType is the typing program that dares to be fun. It combines the fast action of video games with the best instructional program available. The results? Highly motivated and enjoyable learning.

**Two programs on one disk.
One for the office, one for the home.**

Whether you use your PC at home or in the office, MasterType is for you. The color version will dazzle your children as it teaches them to type. The monochrome version doubles your return by improving your productivity at the office. MasterType is one of the best software investments you can make.

But don't just take our word for it.

Infoworld was impressed by MasterType's ability to teach and entertain. They wrote: "MasterType is an excellent instructional typing game. We had fun reviewing it, and we highly recommend it to those who want to learn typing in an unconventional but motivating way."

Infoworld also went on to rate MasterType as Excellent in all four of its review categories.

Order MasterType Today.

MasterType has 18 explosive keyboard lessons to making typing a blast. \$49.95 for the IBM PC. Requires disk and 64K.

Lightning Software®
P.O. Box 11725, Palo Alto, CA 94306
415/327-3280



MasterType is a registered trademark of Lightning Software, Inc. Apple is a registered trademark of Apple Computer, Inc.

CIRCLE 513 ON READER SERVICE CARD

THE ORGANIZERS by APTEK®



MONITOR STAND

This stylish monitor stand will give your system the professional look. By movement in two axes it will securely hold ANY monitor at the optimum position for reduced glare and eyestrain.

APTEK 430 **\$44.00**

PRINTER STAND

(not shown)

A needed addition to all printers. Includes a shelf and enough storage room under the printer to store a full 4" of paper.

APTEK 26 (in MX-80 type) **\$27.50**

APTEK 28 (in MX-100 type) **\$29.50**

SOUND CONTROL PRINTER STAND

Includes a tough acrylic cover for sound reduction, acoustic foam and special padding to reduce bothersome printer noise. Holds 4" of paper under the printer (center feed too).

APTEK 320 (in MX-80 type) **\$79.50**

APTEK 326 (in MX-100 type) **\$89.50**

FLOPPY DISK RACK

Attractive and durable with a hinged acrylic cover for maximum disk protection. Reduces dust related disk errors! Designed for over fifty 5" disks.

APTEK 505 **\$29.50**

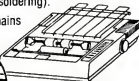
Send payment to: Apogee Designs Ltd., 3100 Fallsport Rd., Baltimore, MD 21211. Phone (301) 235-7523. Master Card and Visa. Add \$2.50 for freight per unit (Continental U.S.) Add 5% sales tax for MD residents.



CIRCLE 109 ON READER SERVICE CARD

Micro-Grip™ III FRICTION FEED for your EPSON MX-80 or RX-80

- Converts your printer to friction feed of SINGLE SHEETS or ROLL PAPER.
- Fits other printers based on Epson models (IBM PC, Commodore, H-P Dot Matrix, etc.).
- Simple installation; all you need is a screwdriver (no soldering).
- Tractor Feed remains undisturbed.



ONLY \$39.95

ADD \$2.00 FOR SHIPPING
CA Residents add 6% sales tax

MONEY BACK GUARANTEE • QUANTITY RATES AVAILABLE

MICRO-GRIP

3164 DUMBARTON AVENUE, DEPT. PC
SAN BERNARDINO, CA 92404
PHONE (714) 864-6643



CIRCLE 602 ON READER SERVICE CARD

the following two messages.

```
Test program SCREEN
A one-line prompt
```

However, there is a subtle difference between `writeln` and `write`. The difference is that `writeln` causes the cursor to move to the next line, while `write` does not. To force the cursor to move to the next line of output, we must include the next statement in program `SCREEN`.

```
writeln
```

This is the `writeln` intrinsic procedure again. Only, this time it has no list of values to display. Hence, this statement simply causes the screen cursor to go to the next line. A `write` followed by (concatenated to) a null `writeln` has the same effect

following `writeln`.

```
end.
```

This ends the executable part of the program. All of the statements enclosed between the opening `begin` and the closing `end` are translated into actions to be carried out by the computer. The actions included in sample program `SCREEN` are defined by built-in programs called `write` and `writeln` (pronounced "write line").

The period is used to terminate source program text. The period tells the Pascal translator, "that's all folks." Be careful to not use the period following the keyword anywhere else but after the absolute end of the program, or as part of a real number (e.g. 7.5).

Data Types?

You have seen an example of a program with simple constants `A` and `B`, and another example with simple output. But before you can write exciting Pascal programs, you must be able to input values (data) and store these values in memory somewhere. To do this, you must first understand the concept of a program storage "variable."

Program Variables and Types

A program "variable" is declared by putting its name in a `var` statement. A variable has a "name," "value," and a "type" in Pascal. The name is any identifier (up to 31 characters beginning with a letter, and including letters, numerals, and underscore.) Here are some names of variables.

```
MY_COUNT
INTEREST
M16
```

Names cannot have imbedded special characters like `$` and `%`. Therefore, these are incorrect names of variables.

```
SCOST
BILLS
MONEY%
UP_SET
```

A "value" is any self-defining symbol in Pascal. Thus, `5` is a self-defining symbol meaning five "things." The character string `Test program` is a self-defining symbol(s) meaning a string of characters made up of `T, e, s, t, ., p, r, o, g, r, a, m`.

A "simple type" is a collection of val-

ues. The collection of integers is a type called "integer" in Pascal. The collection of keyboard characters is a type called "char," and so forth.

A "strong type" is a collection of values plus the collection of basic operations that are allowed to be performed on the collection of values. Pascal is a "strongly typed" language, because the variables in a Pascal program are assigned a "strong type."

In Pascal there are four "base types": boolean, integer, char, real.

The collection of values that make up "boolean" are `TRUE` and `FALSE`. The allowed operations on boolean variables and constants are various comparisons like "greater than," "equal to," and others that will be discussed as we learn more about Pascal.

The collection of values that make up "integer" are the integers from -32767 to $+32767$. (These are all of the whole numbers that can be stored in a 16-bit-wide word.)

The collection of operations that are allowed to be performed on integers includes such things as addition, subtraction, integer divide without a remainder, modulus (without the quotient), assignment, etc.

The collection of values that make up "char" are the letters of the alphabet, special character, the space, and the numerals `0` through `9`. You can perform comparisons, assignment, and various conversion operations on "char" variables and constants as shown later.

The collection of values that make up "real" are all numbers containing a decimal point in the range of $\pm 1.7E \pm 38$ (approximately). Real numbers provide about seven digits of precision with the largest number approximately:

1.70141200 E 38

In Pascal, a real number must be written as a number with a decimal point (period) and at least one leading and one trailing digit. Here are some examples.

```
1.5
0.3
1.0
0.1 E 2 (same as 10.0)
```

Here are some incorrect counterexamples. These are not correct because they either exceed the size allowed or they do not contain at least one digit on either side of

***BEFORE YOU CAN
write exciting Pascal
programs, you must be
able to input and store
values in memory
somewhere.***

as a `writeln`. Therefore, we could have eliminated the two lines:

```
write ('A one-line prompt');
writeln
```

and in their place we could have put:

```
writeln ('A one-line prompt')
```

However, there are many places where we do not want to move the cursor to the next display screen line after a message is displayed. In such cases we must use the `write` instead of the `writeln` intrinsic procedure.

A further note on the statement line containing `writeln` is needed. Notice that there is an absence of a semicolon following `writeln`. This is not a typo or error. The semicolon means to concatenate two statements. They are a reserved keyword followed by a period to punctuate the end of the program. It is not necessary (although it is permitted) to use a semicolon to concatenate a reserved keyword to a statement. Therefore, no semicolon appears

the decimal point.

```
1.  
.5  
1.5 E 40
```

The allowed operations on real variables and constants are the usual arithmetic operations, assignments, etc. We will examine these operations in greater detail when the need arises.

Ordinal versus Infinite Types

One of the unusual things about Pascal is the way it treats "countable" types as opposed to "uncountable" types. The base types boolean, integer, and char are countable, while the base type real is not. In fact, there are 2 values in the type boolean, 2^{16} values in type integer, and 256 in the type char (on the IBM computer you can use all 256 extended ASCII codes). But we do not know how to count all of the real numbers in mathematics, so we call these the uncountable or infinite numbers. Thus, in Pascal, "real" stands apart as an infinite type. This will cause some exceptions in Pascal, as you will see.

We can divide the base types into two groups. In the first group, called "ordinals," the values can be counted. In the second group, called "non-ordinals," the values cannot be counted because there are an infinite number of possible values.

YOU MIGHT
*think of a type as a kind
of unit of measurement.*

The VAR Statement

A variable is assigned a name and a type by placing it in a "var" statement. In fact, we must define the name and type of all variables that are used in a program by listing them in a single "var" statement.

```
var  
  x : real ;
```

The keyword var is followed by the name of the variable, followed by a colon, followed by the type. This declaration is going to be either concatenated to another definition or the remainder of the pro-

gram, so a semicolon is used after the type.

Here, x is a variable that can take on real values, only. Furthermore, since x is real, only the operations defined for real values will be allowed to be performed on x.

```
var  
  x, y, z : real;
```

Here we have used commas to separate the names of a list of variables. This shows how you can declare x, y, and z as real-valued variables in a single line of Pascal. You could also have used three separate lines and the results would have been the same as shown below.

```
var  
  x : real ;  
  y : real ;  
  z : real ;
```

There can only be one var in a program. Therefore, you must use either the commas or the multiple lines as shown above. The following is not allowed.

```
var  
  x : real ;  
var  
  y : real ;  
var  
  z : real ;
```

You can put multiple names and multiple lists of types in a single var statement as the following example illustrates.

```
var  
  x, y, z : real ;  
  m, n : integer ;  
  bit : boolean ;
```

Notice that the var and const statements define the names of all data in a program. Therefore, the var and const statements control how the memory is used to hold data, whereas the begin-end pair enclose and define the memory region containing instructions.

The difference between a const name and a var name is simply this: a const never changes its value, but a var may. Therefore, the value stored in a named constant never changes. The value stored in a var name may be changed by merely storing some new value over the previous value.

The Notion of Type, Revisited

The first time you encounter the notion of a data type in a strongly typed language

like Pascal, you probably think it is an unnecessary bother. So why is it useful to force a type on every piece of data stored in a program?

You might think of a type as a kind of unit of measurement. Suppose, for example, we define FT as a variable that can

WHY IS IT
*useful to force a type on
every piece of data
stored in a program?*

hold so many feet, and IN as another variable that can hold inches. For example, we can let FT be 10 feet and IN be 5 inches. Now, suppose we want to add these two values together. That is, we want to add: FT + IN. We say that these two are incompatible because they have different units of measurement.

We must change FT and IN into the same types (units of measurement) before we can add them together, meaningfully. Suppose we change FT to inches and then add: 120 + 5. The result, 125, is in inches.

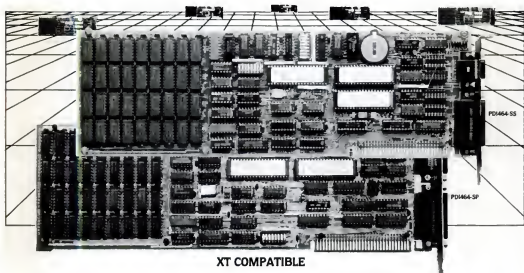
In Pascal we say FT + IN is a "mixed type expression," because the variables do not have the same base type. The rules for changing the types of variables and constants must be followed closely or else your Pascal program cannot be translated into correct machine language.

You may still wonder why strong typing is useful. In fact, strong typing is an obstacle to be overcome in many situations. So why use it? The answer is in the area of program correctness. In a strongly typed language it is easier to write correct programs because the translator can catch many of the errors like the one found in the mixed type example above.

A large, complex program may have errors in it due to incorrect use of its variables. The translator can help you catch these errors by checking for mixed type expressions, and either warning you, or in many cases, stopping you altogether. /PC

Ted G. Lewis is an instructor at Oregon State University in Corvallis.

Plug Pure Data



If you're looking for a multi-function board, you're faced with a bewildering array of functions, manufacturers, and prices. It's important to select the right card for your present and future needs. Pure Data offers a variety of high-quality expansion boards designed for the utmost in reliability and flexibility. We invite you to make comparisons with other brands. Our support software and documentation is the most complete available. Surprisingly enough, our products cost a lot less than you would expect. All of our IBM Personal Computer products are covered by a one year limited warranty, with a technical support hot-line and guaranteed 48-hour service.

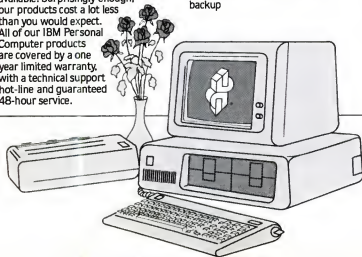
PDI464-SP

- Up to 256K of RAM, fully socketed, with parity generation/checking
- Highest quality ceramic RAM chips used throughout
- IBM-compatible serial channel with selectable address and 6-foot cable
- IBM-compatible parallel printer adaptor with selectable address
- Real Time Clock/Calendar with field-replaceable lithium battery backup

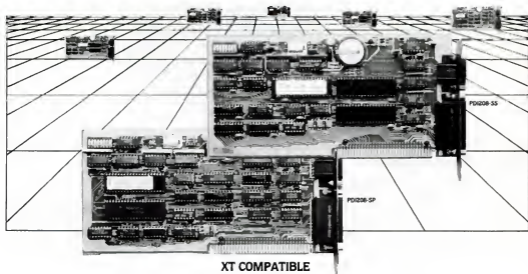
- p-Disk™ disk emulator for single/double-sided diskette emulation
- Print spoolers for parallel and serial channels with multiple copies
- Software for clock support, dynamic memory configuration, memory testing
- Only occupies one expansion slot
- Fully-illustrated installation and operation manual

PDI464-SS

- Up to 256K of RAM, fully socketed, with parity generation/checking
- Highest quality ceramic RAM chips used throughout
- Two IBM-compatible serial channels with selectable addresses, 6-foot cables



into your PC!



XT COMPATIBLE

- Serial channels feature modem/printer configuration jumpers
- Real Time Clock/Calendar with field-replaceable lithium battery backup
- p-Disk™ disk emulator for single/double-sided diskette emulation
- Print spoolers for parallel and serial channels with multiple copies
- Software for clock support, dynamic memory configuration, memory testing
- Only occupies one expansion slot
- Fully-illustrated installation and operation manual

PD1208-SP

- IBM-compatible serial channel with selectable address and 6-foot cable
- IBM-compatible parallel printer adaptor with selectable address
- Real Time Clock/Calendar with field-replaceable lithium battery backup
- p-Disk™ disk emulator for single/double-sided diskette emulation
- Print spoolers for parallel and serial channels with multiple copies
- Software for clock support, dynamic memory configuration, memory testing
- Only occupies one expansion slot
- Fully-illustrated installation and operation manual

PD1208-SS

- Two IBM-compatible serial channels with selectable addresses, 6-foot cables
- Real Time Clock/Calendar with field-replaceable lithium battery backup
- p-Disk™ disk emulator for single/double-sided diskette emulation
- Print spoolers for parallel and serial channels with multiple copies
- Software for clock support, dynamic memory configuration, memory testing
- Only occupies one expansion slot
- Fully-illustrated installation and operation manual



**Pure
Data Ltd**

950 Denison Street, #17,
Markham, Ontario, Canada L3R 3K5
☎ (416) 498-1616 ☎ (416) 475-2424

CIRCLE 325 ON READER SERVICE CARD

Pure Data products are available through.



OnTrak

DATA SYSTEMS

2974 LBJ Freeway, Suite 200,
Dallas, Texas 75234.
Telephone (214) 620-8000

Keysoft International, Computerland,
Computer Innovations, Compugroup,
ECOSEA Technologies and others.

**Only one
program handles
all your funds
and investments
and trusts
and partnerships
and business ledgers.**

One. Alone.

Only MoneyTrack lets you—or your secretary—keep your books for all accounts, business and personal, with one program. All funds, investments, trusts, and all your business ledgers. Everything. Simultaneously.

Only •MONEY•TRACK• does it.

No other financial program for personal computers can do it. You'd need two, three, maybe four; and you'd still have to tease and trick them into doing the things MoneyTrack is already programmed to do easily.

Even then you wouldn't enjoy MoneyTrack's greatest benefits. Because having everything in one program gives you unmatched flexibility.

For instance, only MoneyTrack lets you do a cross-analysis of both business and personal income and expense. You can track tax-sensitive accounts—like interest income/expense and capital gain/loss—across every one of your ventures.

This, and much more—only with MoneyTrack.

Is •MONEY•TRACK• for you?

It's specifically designed for those with multiple sources of income, varied interests. The entrepreneur, investor, business manager, general partner, developer; those with a small business, farm, retail store, professional practice.



For you, MoneyTrack is not only the best program, it's the only one that makes sense.

What's more, you don't have to know anything about bookkeeping, and the very minimum about computers. MoneyTrack's "big system" programming takes care of you.

Find out—free.

MoneyTrack is under \$350. And to know what it's worth, you must see how much it does for you.

Nothing easier. You can get a free, no-strings, interactive teaching demonstration of MoneyTrack at any ComputerLand—and many other computer stores. Just go and ask.

Or call us, and we'll arrange it for you.

Pacific Data Systems, Inc., 6090 Sepulveda Blvd., Culver City, CA 90230. (213) 559-8713.

ASK FOR

=MONEY=TRACK=

Runs on IBM PC • XT • Displaywriter
Digital Rainbow 100 • IBM PC compatibles
Others to be announced soon



PACIFIC Data Systems, Inc.

**A
PROVEN
TIME-SAVER**

for thousands of satisfied customers.

PROGRAM COMMANDS at your fingertips.

- 1-2-3™
- WORDSTAR®
- VISICALC®
- dBASE II®
- MULTIPLAN®
- SUPERCALC®
- SUPERCALC 2™
- EASYWRITER® II



What to do and How to do it - INSTANTLY!

By using a KLEERTEX® Keyboard Template, you will save valuable time others spend paging through manuals. This Constant Learning Aid and Instant Reference Guide enables you to quickly gain confidence with your program.

- ALPHABETICAL LISTING OF COMMANDS
- DESIGNED BY TRAINING SPECIALISTS
- CLEAR INSTRUCTIONS - A "CLEAR TEXT"
- USED IN SEMINARS AND CLASSES
AROUND THE WORLD
- EASY TO READ - QUICK ACCESS

- DURABLE, NON-GLARE PLASTIC
- PRINT WILL NOT SCRATCH OFF
- COLOR COORDINATED
- 15 DAY MONEY BACK GUARANTEE



**CREATIVE
COMPUTER
PRODUCTS™**

CALL OR SEND ORDER FORM TO:
CREATIVE COMPUTER PRODUCTS
P.O. BOX 85152 - MB 134
SAN DIEGO, CA 92138 (619) 268-0793

Call Toll Free
1-800-231-5413
California 1-800-523-5441

DEALER INQUIRIES INVITED

This KLEERTEX can be used on COMPAQ® Computer. KLEERTEX also available for APPLE®, OSBORNE®, and KAYPRO® Computers.

ORDER FORM

I would like to use my IBM®-PC more efficiently. Please send me the following KLEERTEX® Templates:

ONE PROGRAM/ONE SIDE

- ___ WORDSTAR® \$19.95
- ___ VISICALC® \$19.95
- ___ SUPERCALC® \$19.95
- ___ EASYWRITER® II \$19.95

ONE PROGRAM/BOTH SIDES (Reversible)

- ___ dBase II® \$32.95
- ___ 1-2-3® \$32.95
- ___ MULTIPLAN® \$32.95
- ___ SUPERCALC 2™ \$32.95

ONE PROGRAM ON EACH SIDE (Reversible)

- ___ WORDSTAR®/SUPERCALC® \$32.95
- ___ WORDSTAR®/VISICALC® \$32.95
- ___ EASYWRITER® II/SUPERCALC® \$32.95
- ___ EASYWRITER® II/VISICALC® \$32.95

Add \$1.95 shipping per order.
(CA add 6% TAX - OUTSIDE US add \$5.00)

- ☐ Check Enclosed ☐ VISA
- ☐ Money Order ☐ MASTERCARD
- ☐ Send Catalog only



© Creative Computer Products 1983

(Please Print Clearly)
NAME _____
STREET _____
CITY _____ STATE/ZIP _____
VISA/MC ACCOUNT NO. _____
SIGNATURE _____ EXP. DATE _____

☐ Please send me your FREE catalog of Wonderful Time-Savers.

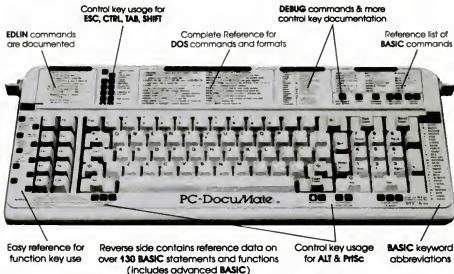
IBM is a trademark of International Business Machines. Wordstar is a trademark of Micropro. EasyWriter is a trademark of Information Unlimited Software. dBase II is a trademark of Ashton-Tate. Supercalc is a trademark of Sorcim. Visicalc is a trademark of VisiCorp. Multiplan is a trademark of Microsoft. 1-2-3 is a trademark of Lotus.

Take Your Computer's Commands And Put Them Where They Belong. On Your Keyboard.

PC-DocuMate™ is a documentation template that fits the keyboard of your IBM PC. So the information you want is where you need it. PC-DocuMate templates are professionally designed, logically organized and comprehensive. Each template is printed on both sides of durable, non-glare polystyrene and is color-matched to your PC keyboard.

PC-DocuMates now available for each of the following:

- DOS/BASIC 1.1 (as shown)
- WORDSTAR™
- SuperCalc™
- MULTIPLAN™ 1.00
- DOS/BASIC 2.0
- dBASE-II™
- VisiCalc™
- MULTIPLAN™ 1.06
- CUSTOM "do-it-yourself" template (with pen and eraser)
- 1-2-3™
- VOLKSWRITER™
- EASYWRITER II™



EACH TEMPLATE IS ONLY \$14.95 (Includes shipping)



No-Risk, Moneyback Offer: If you are not completely satisfied, return your PC-DocuMate template to us (undamaged) within 10 days for a full refund.

Please send personal check, money order, or credit card information. Foreign orders add \$5.00 (except Canada). No COD's please. Telephone orders: Call 919/787-7703. (NC residents add 4% sales tax.)

Systems Management Associates
P.O. Box 20025, 3700 Computer Dr.
Raleigh, N.C. 27619 Dept. B-3



Canadian customers please send \$23.95 CDN for each template to: **Systems Management Associates**, 55A Westmore Dr., Dept. B-3, Rexdale, Ontario M9V3Y6

Dealer Inquiries Invited.

NEWS FOR BUSINESS USERS OF IBM MINI'S...

Announcing DBA 34/36... the RPGII Data Base

5 Reasons Why DBA 34/36 Will Increase the Facility, Speed, Accuracy
and Flexibility of Your Information Processing and Lower
Your New Business Applications Costs

Now there is a true data base management system (DBMS) for IBM System 34 and 36 users which organizes computer files into a single, coordinated information bank that is accessible in a variety of logical groupings—DBA 34/36 from FTS Systems Inc. Here are five reasons why you should be using it with your mini:

1. DBA 34/36 is the only data base management system designed for both the IBM System 34 and the new System 36—a true data base, not just a scaled-down version of mainframe software or retrieval tool.

2. DBA 34/36 makes it easy to define and produce recurring reports including simple user-defined calculations. All requisite support programs, including Data Base Maintenance, a powerful Universal Inquiry Program, RPG II Interface and a Report Generator come with the package.

3. Because DBA 34/36 is written in RPG II, your programmers can adapt any of its calling subroutines into your own programs, significantly reducing programming time for new applications.

4. DBA 34/36 can be up-and-running in less than a week because it does not change existing files. Instead, DBA 34/36 creates an external structure that manages references to your files with remarkable efficiency. An experienced programmer can install DBA 34/36 and have it running inquiry against your files in just a few days.

5. No schooling is required—your staff will quickly become proficient with DBA 34/36 by simply using the "user friendly" manual supplied with the package. The manual describes installation procedures and includes complete instructions for tailoring DBA 34/36's functions to reference the files selected for installation.

You Can Try DBA 34/36 For 45 Days FREE

We offer qualified users a free 45 day trial of DBA 34/36 in order to demonstrate what it can do for you. We'll send you a copy of the software, and complete installation documentation, for a 45 day free trial to use on your own system. We think you'll wonder how you ever did without it—but, if you're not completely satisfied, simply return the package—there's no further obligation.

Free Demonstration Disk Available



FTS

Casey Stern, Vice President
FTS Systems, Inc.
DBA Department
65 West Red Oak Lane
White Plains, N.Y. 10604
212-269-5540 • 914-694-1554

☐ YES, I'm interested in your DBA 34/36 Software Package.

Please send me:

- ☐ FREE DEMO DISC which illustrates DBA 34/36
- ☐ COMPLETE PACKAGE for 45-day free trial
- ☐ MORE INFORMATION—have a sales rep contact me.

Name _____ Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Telephone () _____ Best Time _____

Mail This Coupon Or Call (914) 694-1554

Word processing software may save you time, but it can't write your letters.

Gentlemen

Our company has always given generously to the larger funds, but the turtles

Gentlemen

Although this company feels it is important to save the turtles

Gentlemen

Due to the recession our company has had to cut back on contributions. Although we would like to contribute

Gentlemen

We regret that we will be unable to contribute to your fund to save the turtles. The company policy dictates that we limit our contributions to large multi-purpose campaigns. Each year we cooperate with the employees of our company on a national basis in providing support for the United Way and the National Museum Foundation

It is in this fashion that we are best able to serve a number of worthy causes. We trust you will understand our position. We support your goals and stated purpose and wish you every success in your campaign

Sincerely,

Or can it?

You really can save time, write better letters and have a complete reference to both commonly and rarely used letters and forms. 1000 professionally written letters and forms are on diskette and can be read, modified and printed using most word processing software. It is easy to find the letter or form that is best for almost any situation in the categorized and indexed manual. The topics covered include agreements, announcements, charities, condolences, collections, congratulations, employees, employers, general business, general forms, legal forms, ordering, personal, promissory notes, sales, schools, shipping, stockholders and writer's reference . . . just to name a few.

Letterform 1000 requires:

A computer that can read double-sided IBM Personal Computer diskettes

Word processing software that can read standard ASC II files.

Available at most computer software dealers \$95
Call or write for more information:

PBL Corporation
PO Box 559
Wayzata MN 55391
612 473-8998

Letterform 1000

CIRCLE 355 ON READER SERVICE CARD

QUANTUM'S MULTI-TASKING, MULTI-USER REAL-TIME DEVELOPMENT SYSTEM FOR THE IBM PC.

\$650

THE QUANTUM SYSTEM FEATURES . . .

THE MULTI-TASKING MULTI-USER REAL-TIME MESSAGE-PASSING OPERATING SYSTEM

(QNX)*

FASTER, SMALLER AND BETTER THAN UNIX!**

- ☐ Up to 250 Simultaneous tasks
- ☐ Either Four or Sixteen simultaneous users
(specify on order entry)
- ☐ Code sharing and re-entrancy
- ☐ 16-level task priorities
- ☐ Alterable time-slicing
- ☐ 1-megabyte memory management
- ☐ Device independent input/output
- ☐ Disk-loadable drivers
- ☐ Davong & Genii Drivers standard
- ☐ Ramdisks standard
- ☐ Disk-loadable command shell
- ☐ Pipes in the shell
- ☐ Task Creation
 - Create a new task
 - Fork (make exact copy of a task)
 - Transform to new task
- ☐ Inter-Task Communication
 - Messages: Send, Receive & Reply
 - Ports: Attach, Detach & Signal
- ☐ 9.6KB Real-Time
- ☐ Command recall & Re-execute
- ☐ Type-ahead & command line editing
- ☐ Serial & Parallel printer support
- ☐ Printer spooling

THE QUANTUM C COMPILER &
8086/8087 ASSEMBLER
Full Kernighan & Ritchie V7

*QNX is a trademark of Quantum Software Systems, Ltd.

FILE SYSTEM

- ☐ Hierarchical file structure limited only
by disk storage availability
- ☐ Time & date stamping of all files
- ☐ 16-character file and directory names
- ☐ User, File, Directory & Disk Security
- ☐ Record Locking via "Agent" tasks
- ☐ Multiple readers but one writer
- ☐ Random file input/output
- ☐ 32-megabytes per logical drive (8 total)

FULL SCREEN EDITOR

- ☐ Memory resident, Ultra-Fast
- ☐ 256 column window
- ☐ Insert, block copy, move & delete
- ☐ Autosave
- ☐ Word-wrap & autofill
- ☐ Powerful pattern matching and replacement
- ☐ Global commands and extensive macro
capabilities
- ☐ Complete keyboard translation
- ☐ Color card supported
- ☐ The Quantum Line Editor is a subset

SYSTEM UTILITIES INCLUDE

- ☐ General listing & sorting
- ☐ Backup files by date, time & pattern
- ☐ Async Communications to 9.6KB
"TALK" to mainframes or micros
Secure (CRC, block re-send)
- ☐ Read and Write PC DOS files
- ☐ Debugger
- ☐ On-line command syntax help

**UNIX is a trademark of Bell Laboratories

ADDITIONAL QUANTUM COMPILERS

All compilers use the INTEL 8087 coprocessor for floating point calculations
Separate compilation & cross linking, link modules from different languages
for rapid system development

Single large shared library

Simple library update mechanism which allows new modules to be added
using the editor alone

DOC - TEXT FORMATTER

A powerful imbedded text processing system
Recursive, macro extendable
Form letter and mailing list capabilities

BASIC (Compatible with PC Basic)	\$300.00
FORTRAN (ANSI 77)	\$300.00
PASCAL (With full extensions)	\$300.00
INTEL 8087 COPROCESSOR	\$250.00
MANUALS	\$100.00
ON-LINE SYSTEM DOCUMENTATION	\$100.00
SOURCE FOR THE SHELL	\$100.00
ANNUAL SYSTEM UPGRADE	\$200.00
DOC - TEXT FORMATTER	\$300.00



QUANTUM
SOFTWARE SYSTEMS, INC.
7219 Shea Court
San Jose, California 95139

Tel (408) 629-9402

I am a ☐ User ☐ Dealer ☐ Distributor
☐ Please send me a brochure

Name _____ Title _____
Company _____
Address _____
City _____ State _____ Zip _____



QUANTUM
SOFTWARE SYSTEMS, LTD.
P.O. Box 5318, Station "F"
Ottawa, Ontario, Canada K2C 3H5

Tel: (613) 235-4297

I am a ☐ User ☐ Dealer ☐ Distributor
☐ Please send me a brochure

Name _____ Title _____
Company _____
Address _____
City _____ State _____ Zip _____

CIRCLE 427 ON READER SERVICE CARD

Thinking about buying something you've
seen in this magazine? Getting the best
price is as easy as

1-800-554-7661

The call's on us and the savings are on you.
We're old fashioned merchants in a high
tech world — hardware, peripherals, software
and accessories at user friendly prices.

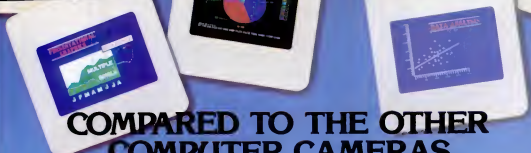
Epson RX-80 Printer	\$589.00
Hayes 300 Smartmodem	\$199.95
Hayes 1200 Smartmodem	\$499.95
Elephant Diskettes, box of 10 SSDD	\$ 19.95
Verbatim Datalife Diskettes, box of 10 SSDD	\$ 24.95
Quadchrome Color Monitor	\$439.00
Micropro Professional Packs, each	\$599.00
(Wordstar, Spellstar, Mailmerge, Starindex)	
Sanyo 12" Green Monitor	\$ 99.95
ATI Training Programs, each	\$ 59.95
Persyst 64K Ram & Clock/Serial	\$249.95

micro STOREHOUSE

Micro Storehouse Company
333 Peters Street, S.W.
Atlanta, Georgia 30313

In Georgia call 404-577-6892
Visa, MasterCard and American Express accepted

CIRCLE 436 ON READER SERVICE CARD



COMPARED TO THE OTHER COMPUTER CAMERAS CELTIC'S VFR 2000 LACKS TWO FEATURES: GUESSWORK AND SOFTWARE.

Celtic's VFR 2000 Computer Camera does more than turn computer generated graphics into full color 35mm slides. It does so in seconds. For a few pennies each. And it doesn't miss.

You won't find better image quality anywhere. And thanks to Celtic's unique Image Preview Port, working along with a LED display of the film frame and a "ready" indicator, there's no guesswork to the system.

And you won't find any other computer camera that's so easy to use. Because unlike most, the VFR 2000 requires absolutely no software. Just take it out of the box and put it to work. Besides, your entire office will enjoy convenient advantages like a fully automatic film wind and rewind capability. And our Color-Enhanced Monochrome (CEM), a feature that lets you make color copies even when your display is in black and white! Use standard slide film, including new Polachrome® Instant 35mm film for immediate developing and

mounting of your slides.

Use it to project crisp, clear images as big as wall size, the perfect way to dramatize business graphics for management meetings, training programs or just about anything. The VFR 2000 is a natural addition to your personal computer or computer graphics system capability. It hooks up universally to a large number of computer systems, from PCs to mainframe workstations like the IBM® 3279. It's also adaptable for use with a wide range of graphics terminals. And just like your color monitor, it accepts either RS 170 or TTL inputs.

We price our VFR 2000 model under \$2,500. And we're ready to match its value to that of anybody else's computer camera—higher priced or lower. Because we're ready to work as is. Others aren't.

For a hands on demonstration call Celtic Technology at (213) 884-6767 or return the coupon below.

**CELTIC
TECHNOLOGY**

Innovation in Computer Photography
CIRCLE 213 ON READER SERVICE CARD



Celtic Technology, Inc., 6265 Varlei Avenue
Woodland Hills, CA 91367 (213) 884-6767

- ☐ I would like a hands on demonstration.
☐ Please send me a product brochure.

Name

Title

Company

Telephone

Address

City State Zip

© 1983 Celtic Technology, Inc.
Photography Examples Courtesy of: 1) Ramtek Corporation of Santa Clara, CA, 2) XIPHAS,
Santa Monica, CA, using their Software System, Videograph

IBM is a registered trademark of IBM Corporation

PC 81 83



A Hollywood vice unit has come to rely on a PC-XT to help keep track of "professional" offenders. Its success could pave the way for extending XT's reach into other areas of law enforcement.

Just The Facts, RAM

Her AKAs filled the computer screen—Cynthia Williams, also known as Candy Adams, Carrie White, Cindy Walters, Doreen Hill. On the street, she was 20 different people to any number of different johns. To the police, she was a familiar face, one of thousands of prostitutes with long strings of assumed names that marched across this CRT display like an army of phosphor spiders. Scanning the monitor, I noticed, however, that this woman had one stand-out, identifying mark: deceased.

I was sitting at the desk of the toughest record keeper in the city of Los Angeles—the PC-XT at the Prostitution Enforcement Detail of the Los Angeles Police Department's Hollywood Division. The XT sat silently bathed in the fishbelly-white fluorescent light of the division offices. Cops, costumed in Bermuda shorts and Hawaiian-print shirts, strolled in and out of the

little computer room. This evening a prostitution task force would sweep the streets, and they were dressed to bait the ladies.

PC Joins the Force

The strange tale of the PC-XT that keeps track of the "professionals" had begun about a year earlier, when the Hollywood Chamber of Commerce solicited funds from the private sector to purchase a PC-XT and a printer. The LAPD was told that if the police could contribute time and personnel, the Chamber of Commerce would donate a system designed to handle the voluminous police files.

Once the police department had acquired the hardware, John Discole, director of marketing for John Cappelletti Associates, a division of Computer Contractors Association, Inc., promised to supply software for the XT on a free-license basis—

that is, free of charge. If the system proved effective, Cappelletti, who doubles as a pro football player, planned to expand into other areas of law enforcement.

Three man-years and 1 calendar year later, the system is in place. John Cappelletti Associates called it HAVES (Hollywood Area Vice Enforcement System). Though HAVES could be adapted easily to any area of police work, the vice unit was chosen as its proving ground.

I holed up in an office to talk "tech" with Herb Shaw, HAVES' chief designer, who spent 3 months with the police determining working requirements and design specs for a 1-megabyte program. He laid out the facts about HAVES in methodical detail.

HAVES has 384K RAM in its CPU, with 20 million positions available on hard disk and 400K on floppy disk. This database management system can handle as many as 6,000 police cases, with about 2,000 to 2,500 active files. This may not seem like many until you learn that most files include the Hollywood arrest number, the AKA (also known as) name file, a case number, a booking number, a control number, an arrest history file, a charge number—the list goes on to include 18 to 50 case-referenced files.

Using dBASE II, HAVES is totally menu-driven and contains approximately 50 separate programs. It produces hard copy, on-line reports, and regular periodic reports, which flash on the screen everything a prostitute wouldn't want you to know.

dBASE II was chosen for the system because it was quick and made input/output routines simple, Shaw said. He was clearly proud of his work. "As a mainframe designer myself, I think it's as good as any mainframe system," he told me.

Before and After XT

The vice unit previously had kept records on cumbersome stacks of yellow cards. Each arrest was represented by a complete card, replete with a Polaroid snapshot. Each time a prostitute was arrested, the staff had to rifle through the finger-smear stacks.

Now, the system can be fed a number, and it will retrieve data on the subject's outstanding warrants, probation status, citations, field interviews, case-tracking information, and prior-arrest records. Later, this nifty packet goes to the city attor-

ney's office, where folks in three-piece suits can use it to polish up their cases to a fine gloss.

Assignment: Computer Detail

HAVES had, theoretically, put millions of bits of information at the vice squad's fingertips. But who knew how to tap into this great reserve? One of the first staff members to get to know HAVES was Sergeant John R. Johnston, head of the Prostitution Enforcement Detail.

When HAVES first got underway, he was the man selected to learn about it—from scratch. When he started with computers, he knew nothing about them, he told me with a hint of pride. Now, he is responsible for training the other vice squad officers on the system. He was methodically training two sergeants as he spoke to me.

Johnston, a thick-set man with a round face, looked like a cross between a Marine and a teddy bear. He gestured at the files that were being entered piecemeal into the system. Only 250 or so of the thousands of files had actually gone into HAVES at the time.

The office looked like any other windowless government cubby, except for the labels on the battered, gray filing cabinets that read "female prostitutes," "female impersonators," "drugs," and "hustlers."

The system was "designed for the officer on the street," Johnston said. "It gives specific information that they can use

might not seem logical for one who waits to hide one's identity or line of work. The offenders are persistent, though—one woman had racked up 103 names.

Thanks to HAVES, the iota officers no longer need to search through the cards to pair a new AKA with the same old face—the menu-driven HAVES can add



Sgt. Roger Dowis, of the LAPD's Hollywood Division, on duty at the PC-XT.

the latest alias to the list faster than a hooker can ask for the time.

Johnston pointed out another field, labeled "associates." This is where names of people who are linked with the arrestee are entered. It is how the vice unit does "bottle with the pimps," he said. The arresting officer can list a suspected pimp, or the other prostitutes in the pimp's stable. While this won't directly convict anyone, it's often helpful as supporting evidence. The "associates" also can be contacted in case police need to locate someone as a witness or for questioning.

Some prostitutes, because of the overcrowded courts, have a virtual sackful of cases awaiting trial. Johnston mentioned one woman who had 19 cases on the docket. Sometimes these cases can be consolidated into a single arrest, and a system like HAVES makes it easier. Johnston suggested that "the courts probably need automation more than we do."

Getting the data into the system is still a time-consuming process. Six officers process the data gathered at arrest time, but the prostitution detail relies on a volunteer labor force that works with the division to load the backlog of information into the system, Johnston said.

One striking feature of HAVES, I discovered, is that it tracks not only AKAs,

***THE VICE UNIT
previously had kept
records on cumbersome
stacks of yellow cards.***

right away." The field that lists prior arrests is very important since a prostitute's (or any offender's) sentence and bail money increase every time he or she is convicted.

Another tricky bit of data is the name the person gives at the time of arrest, usually an alias. Johnston said that for some reason, the AKA often hews closely to the original name; initials, or the first or last three letters, are likely to match. This

PRO SERIES™

Professional Products For The IBM PC and XT User

Micro Synergy's Pro Series is a diversified line of high quality expansion products for the IBM PC and XT microcomputers. Designed to complement the professional's PC, the Pro Series offers enhanced productivity and uncompromised reliability to the most demanding user.

PRO SERIES 3

Three Function Expansion Card

FEATURES

- 64K-1024K parity checked expansion memory
- RS-232-C Serial Interface
- Parallel Printer Interface

APPLICATIONS

- Additional memory capacity for sophisticated application programs, RAM disks and print spooling
- Serial interface for modems, letter quality printers and asynchronous terminals
- Provides interfacing for any printer utilizing the Centronics type parallel interface



PRO SERIES 5

Five Function Expansion Card

FEATURES

- 64K-1024K Parity checked expansion memory
- RS-232-C Serial Interface
- Parallel Printer Interface
- Clock/Calendar with battery back-up
- Joystick Interface Port

APPLICATIONS

- Additional memory capacity for sophisticated application programs, RAM disks and print spooling
- Serial interface for modems, letter quality printers and asynchronous terminals
- Provides interfacing for any printer utilizing the Centronics type parallel interface
- Provides non-volatile date and time data for event timing or date stamping
- Interface for game joystick controller or general purpose analog interface



PRO SERIES RAM

Expansion Memory Card

FEATURES

- 64K-1024K of expansion memory
- Parity checking for error detection
- High reliability design
- Full speed operation — no wait states
- PC and XT compatible

APPLICATIONS

- Provides the memory capacity necessary for sophisticated application programs
- Storage for high speed RAM disk
- Storage for print spooling



PRO SERIES UTILITIES

The Pro Series Utilities package is a collection of software utilities that will further aid and enhance productive use of the IBM PC and Micro Synergy expansion products. Included in this package are:

- XTRADISK** — RAM disk program for high speed floppy disk emulation
- PRINTBUF** — Allows printer operations to run in the "background" while the CPU continues program execution
- SETKEY** — Each of the ten function keys can be redefined as any character string with this program
- PRINTFMT** — Extends programs that allow you to send text, but not format controls, to the printer. PRINTFMT will add format controls to text files

PRO SERIES INNOVATION

The Micro Synergy Pro Series is an expanding line of quality hardware and software products designed to enhance the IBM PC and XT. Additional Pro Series products available Fall 1983 include:

- **Pro Series MPCC** — Dual Channel Multi-Protocol Communications Controller
The Pro Series MPCC offers two channels of flexible data communications capabilities. Both channels are fully programmable in synchronous and asynchronous modes. Emulation software that supports IBM 3780/2780 RJE is available.
- **Pro Series 488** — IEEE 488 Bus Controller
The Pro Series 488 provides the hardware and software required for a full implementation of the IEEE 488-1978 specification.

PRO SERIES QUALITY

All Micro Synergy products are designed and manufactured to achieve the highest standards of reliability. Each expansion card or system is thoroughly tested to insure complete functionality. A one year parts and labor warranty is provided.

Micro
Synergy, inc.

187 Ulmerton Road, Largo, Florida 33544 (813) 584-2488

IBM PC is a registered trademark of International Business Machines Corp.

CIRCLE 439 ON READER SERVICE CARD

PeachText 5000™

In a word,
a star is born.

**ONLY
\$299.95**
Plus 10 Free Diskettes



PeachText 5000 has arrived. A complete personal productivity system for word processing, financial modeling and simple data-management. All at one price.

PeachText 5000 is available for a select list of microcomputers: The IBM Personal Computer™, the COMPAQ Portable Computer™, the Texas Instruments Professional Computer™, and the Zenith Z-100™. Plus 90 day support from Peachtree Software Inc.



- Quantity Discounts Available
- Dealers Inquiries Invited

COMPU-MEDIA SOFTWARE INC.

(Div. of Compu Media Supplies Inc.)
150 Main St., Staten Island, N.Y. 10307
TERMS:—VISA, M.C. or C.O.D.
CALL TOLL FREE 1-800-248-2418
IN N.Y. STATE 212-967-1700

CIRCLE 481 ON READER SERVICE CARD

NEW

**Announcing
a solution to the most
common computer
problem.**

(Where to put the equipment.)



\$129.95
RETAIL

Monitor Mover. You won't have to buy any expensive new furniture. You won't lose any desk space. Monitor Mover adjusts in four ways to each individual user while keeping the monitor (and system, if necessary) completely off your existing work space. Available for most popular brands of computer monitors.

Lintek
Computer Accessories

Dealer inquiries
welcome

PO Box 8056, Grand Rapids, MI 49508 (616) 241-4040

CIRCLE 259 ON READER SERVICE CARD

OUR ISOLATORS FOR YOUR PROTECTION

Prevents:

disk drive woes, printer interaction,
memory loss and damage due to
lightning or AC power line
disturbances.



Commercial Grade Isolators

ISO-1	3 Isolated Sockets	\$76.95
ISO-2	2 Isolated Socket Banks, 6 Sockets	76.95

Industrial Grade Isolators

ISO-3	3 Double Isolated Sockets	115.95
ISO-11	2 Double Isolated Banks, 6 Sockets	115.95

Laboratory Grade Isolators

ISO-17	4 Quad Isolated Sockets	200.95
ISO-18	2 Quad Isolated Banks, 6 Sockets	169.95

Circuit Breaker, any model (Add-CB)	Add 10.00
Remote Switch, any model (Add-RS)	Add 18.00

ESP Electronic Specialists, Inc.
171 South Main Street, Box 369, Natick, Massachusetts 01760

Toll Free Order Desk 1-800-225-4876
MasterCard, VISA, American Express

CIRCLE 236 ON READER SERVICE CARD

BasicWindow™

Screen Generation Systems for BASIC Applications

Don't Waste Time Programming Screens!

BasicWindow is a productivity package that streamlines your application development activity with powerful design and programming tools.

BasicWindow is a total package that integrates all screen generation functions. It consists of:

- 1 A powerful **Screen Editor** which lets you design program screens, including graphics and color
- 2 A **Macro Language** and **Macro Compiler** to provide an integrated programming interface to the screen driver routines
- 3 A powerful **Screen Driver** which is easily merged with your application program to control screen processing
- 4 A complete manual and reference card

If you develop BASIC applications on the IBM PC, IBM XT, or selected compatibles, you can't afford to be without BasicWindow. You also need DOS 1.1 or 2.0, 64K RAM, One Disk Drive, 80 Column Display, Optional Printer, and BASICA (for your application).

For a complete description, please contact:

GFC Software Design (203) 327-8968
15 Alden Road, Stamford, CT 06902

A Division of G. FREEMAN & COMPANY

IBM is a trademark of International Business Machines Corporation. BasicWindow is a trademark of G. FREEMAN & COMPANY.

CIRCLE 291 ON READER SERVICE CARD

C COMPILER

- FULL C
 - UNIX® Ver. 7 COMPATIBILITY
 - NO ROYALTIES ON GENERATED CODE
 - GENERATED CODE IS REENTRANT
 - C AND ASSEMBLY SOURCE MAY BE INTERMIXED
 - UPGRADES & SUPPORT FOR 1 YEAR
- C SOURCE AVAILABLE FOR \$2500⁰⁰

HOST	4029 TARGET	POP 11* LSI 11* TARGET	8090 (280) TARGET	8096/8098 TARGET
FLEX*UNIFLEX* OS-9*	\$200.00 \$350.00	500.00	500.00	500.00
RT-11*RSK 11* POP 11*	500.00	300.00 350.00	500.00	500.00
CP/M* 8090 (280)	500.00	500.00	500.00	500.00
PCDOS*CP/M86* 8096/8098	500.00	500.00	500.00	200.00 350.00

*PCDOS is a trademark of IBM Corp. MSDOS is a trademark of MICROSOFT. UNIX is a trademark of BELL LABS. RT-11/RSK 11/POP 11 is a trademark of Digital Equipment Corporation. FLEX/UNIFLEX is a trademark of Technical Systems Consultants. CP/M and CP/M86 are trademarks of Digital Research. OS-9 is a trademark of Microware & Motorola.

408-275-1659

TELECON SYSTEMS

1155 Meridian Avenue, Suite 218
San Jose, California 95125

CIRCLE 590 ON READER SERVICE CARD

DATAMATE

...a truly all-purpose DATABASE MANAGER for IBM PC users.

A system that adapts easily to most any form including mailing list, inventory control and general information management.

- fewer management problems: multiple files per disk, no practical limitation on file content
- menu driven commands plus full use of IBM function keys
- cost effective: priced lower than comparable systems, free updates, adaptability
- custom applications available from author, assured compatibility.
- **DATAMATE...TOTAL PACKAGE** including manual, a master diskette, and sample data disk \$249.95

Compu-Haus

507 N.W. Cherokee
Kansas City, Missouri 64150

TO ORDER, CALL 816-587-0660

CIRCLE 108 ON READER SERVICE CARD

If you use DOS, you need this program.

Do a DIR. Look at the size of your program files. You are seeing wasted space. The **Realia Spacemaker™** shrinks your COM and EXE files. No more wasted space.

How it works: Uninitialized (binary zero) areas are compressed, and the relocation entries are eliminated. When executed, the program expands and relocates itself, recreating the original program.

Realia Spacemaker™ \$75 (ppd.)

Talk to DEC® equipment? Use the Realia Termulator™. Full VT100/VT52 emulation and file transfer capabilities.

Realia Termulator™ \$95 (ppd.)

- COD Shipments
- Quantity Discounts

REALIA inc.

(312)

346-0642

10 South Riverside Plaza

Chicago, Illinois 60606

CIRCLE 340 ON READER SERVICE CARD

DISKETTES maxell.

REG. PRICE 5 1/4" 28.95
50/00 SOFT SECTOR

5 1/4" 39.50
50/00 SOFT SECTOR

HOLIDAY GEAR BAG

VERSATIM 50/00 SOFT SECT. 23.95

MEMOREX 50/00 SOFT SECT. 23.95

3M - SCOTCH 50/00 SOFT SECT. 22.95

Add \$2.00 Handling in USA

C.O.D.

5% Tax in Fla. Only

APD/Box No's & Canada

Add 3.50 Shipping

MEGA Q BYTE

8 INDS/TELES

4899 S.W. 48th Street

Ft. Lauderdale, Florida 33314

305-587-1130

1-800-327-1013

© Allow one week delivery. This offer may be restricted to anyone.

1 Buy 2 to 4 Boxes
Get a Library Case With Ea. Box Free

10% OFF REG. PRICE
\$4.50 VALUE

maxell

2 Buy 5 to 9 Boxes

Plastic Storage Flip n File Box Free

(Includes 75 Mini-Disks)

15% OFF REG. PRICE
\$35.00 VALUE

maxell

3 Buy 10 Boxes

Get a Complete Computer Maintenance Kit Free

25% OFF REG. PRICE
\$45.00 VALUE

CIRCLE 406 ON READER SERVICE CARD



\$1495 for a complete 10 megabyte hard disk system is a good deal — but not if you need 23 megabytes of storage!

That's why our 23 megabyte hard disk system is priced at only \$2249. And for another \$895, you'll get 23 megabytes of tape backup security.

The Pegasus 10 and 23 come complete with all the software and hardware you need to start operations.

If you've outgrown the storage capabilities of your IBM PC or compatible computer but haven't grown into the giant pricetags on 10- or 23-megabyte hard disk systems, you're in for a surprise.

The price on these complete systems featuring the latest components just reached an all time low!

And you get everything you need to start working on your hard disk system:

- Top quality formatted fixed hard disk (ST506 compatible)
- Top quality controller card
- Software that runs on DOS 1.1 and 2.0, CP/M 86
- Host adapter
- Integral power supply
- Cables
- External custom chassis with additional space for either our tape backup, another hard disk, or floppy disk drive.
- 90 day warranty

What's the catch?

There is none. It's a simple matter of economics. Pegasus saw the growing need for mass storage, made a commitment to fill this need, purchased thousands of the finest quality hard disks, and is now passing the good deal along to you.

The only thing you may be missing in buying the Pegasus instead of the IBM XT expansion chassis is

something you may not need in the first place: eight expansion slots, a communications card, three little initials, and an extra \$1,000 to \$2,000 out of your pocket.

But don't I need a tape backup for all that storage?

We recommend it! That's why we're offering you the same great deal on a ¼" cartridge tape backup. We've watched other companies offer 10 and 20 megabytes of storage and forget about the backup altogether. Our tape backup, which carries a 90 day warranty, retails for just \$895 — a small price for over 23 megabytes of formatted storage and lots of peace of mind.

Where can I buy a Pegasus hard disk system?

Pegasus systems are available only through dealers. So contact the dealer in your area who sells IBM PC or compatible computers. If he doesn't have Pegasus, chances are he'll carry it soon. Just ask him to call us. We will ship him your Pegasus unit immediately.

Does Pegasus have larger storage systems?

Absolutely. 65 and 140 megabyte systems will soon be available from Pegasus. And the best part is that they, too, are breaking new ground when it comes to pricing. If you've outgrown 10, or even 23 megabytes of storage, ask about the larger capacity units. All with the same top quality hardware and software and full 90 day warranty.



PEGASUS

2200 West Higgins Road • Suite 245
Hoffman Estates, IL 60195 • (312) 843-1090

Dealer inquiries invited.

active warrants, and prior arrests for the officers' use, but also the final disposition of cases and other post-bookings information. Officers are required to keep tabs on the progress of their cases through the courts, and they check back with HAVES periodically for court dates and dispositions of cases.

HAVES also serves up a tickler file of active warrants, open court cases, and incomplete arrest histories, which prods the police into straightening up their files. For the city attorney's office, HAVES packages a list of filed cases, rejected cases, case dispositions, convictions, and sentencing. And to give the professional or amateur court-watcher a thrill, HAVES summarizes case-tracking reports by judge, by city attorney, by arresting officer, and even by disposition of the case within those categories. That means you could spot patterns in arrests or convictions (Does one officer have too many

shorts and dresses and at the police officers in their shorts and jeans. The image they brought to mind was of a party that should have broken up hours ago.

I said goodbye and walked out of the building into the steamy Hollywood afternoon. For me, the day was ending. I headed home through the snarling 5 o'clock

traffic and mentally replayed my conversations with Johnston and the other people involved with HAVES. I thought about the officers; soon they would be hitting the streets on another sweep. I also thought about the prostitutes, and I wondered if they know that the toughest cop on the beat has a heart of silicon. /PC

HAVES

also serves up a tickler file of active warrants, open court cases, and incomplete arrest histories.

arrests that don't stick?), prosecution (Is a certain attorney losing more cases than he is winning?), and sentencing (Which judge won't hand down jail time?).

"Now, thanks to the new system, they actually put pressure on a judge," Johnston said. He cited the case of one judge who used to give only fines to prostitutes. After a deputy chief approached him and pointed out the record, the judge began handing out jail sentences.

Police management also can scan the case tracking reports to catch problems in-house. "The public has a right to know if a city attorney or judge isn't doing the job," said Johnston.

Wrapping up our session, Johnston took me down to where the officers were processing arrests from the latest sweep. I stared at the women in their too-tight

You've got heartburn from eating all those itty bitty dots.
You've trashed every lost dungeon in the unknown universe.
You've blasted ten million mutant alien weasels to bits.

But are you prepared to practice the art of

PERSUASION

Real-time strategy from OLÖRIN



\$40 at your computer store,
or direct from:

OLÖRIN
PC GAMESMASTERS

P.O. Box 719 Amherst, MA 01004 (413)549-0535

- Animated arcade style graphics on a monochrome or color display
- 1000 hours of play testing
- All the features you've come to expect and more!
- Runs optimally on any IBM PC or XT



BiGraphix I is unique. Until now, you could not perform graphics on your IBM Monochrome Display without having true compatibility. You can now do all this with one expansion slot with no additional software required.

BiGraphix II has all the features of BiGraphix I, but with an extended capability of 720 x 700 resolution on IBM Monochrome Display, and 640 x 400 in 16 colors.

BiGraphix

the graphics board that works either way

ACP introduces

BiGraphics I & II:

the graphics cards that will integrate your favorite Monochrome Display and software all with perfect compatibility.

With BiGraphics I you can:

run Lotus 1-2-3 graphics on your IBM Monochrome Display with no additional software;

run your IBM as either normal Monochrome Display or a graphics display;

perform graphics on an RGB monitor and a composite video monitor with a resolution of 640 x 200;

connect both RGB and IBM Monochrome Display simultaneously with either software or hardware switch selectable.

BiGraphix I also provides the convenience of a parallel printer port, has flicker-free scrolling, external switch for color or mono modes, and true DMA capabilities.

CIRCLE 120 ON READER SERVICE CARD

APPLIED COMPUTER PRODUCTS

1916 Welsh Road #6,
Philadelphia, PA 19115
215-934-6990

dealer inquiries welcome

ONLY THE WORLD'S BEST WORD PROCESSOR COULD GENERATE WORDS LIKE THESE.

"PIE:Writer, outscored every other word processing program for microcomputers...(It) crams an incredible amount of power into a small and inexpensive package...PIE:Writer beat four out of six dedicated word processors."

Arthur Naiman
"Word Processing Buyer's Guide"
McGraw Hill Book Company

"PIE:Writer is hard to beat...There is little I can't do with it...Do not fail to check out this program if you are a first time purchaser."

James Martellaro
Peelings II

"All in all, PIE:Writer is one of the most thorough word processing packages available...it can perform many functions in addition to word processing...PIE:Writer just may be the best buy."

Peter Olivieri
"Softalk"
March 1983

Why are some of the most respected authorities in the field of software saying all these nice things about PIE:Writer™? The answer is easy.

Easy to Learn. Easy to Use.

Part of the reason that PIE:Writer is the top ranked word processor is that it's just plain simple to run. In fact, you can use it as soon as you get it home. To write a letter, for instance, just (a) load the program, (b) type the letter 'E', and (c) write your letter. Then, (d) type 'F' to enter the print mode for either screen or paper and you're ready to print. You'll get a perfectly typed, spaced and formatted letter. Now what could be easier than that?

Powerful Features.

Don't confuse our use of the word simple with unsophisticated. PIE:Writer offers features and capabilities far beyond any other word processing programs for microcomputers. And that goes for most of the dedicated word processors as well. Here are just a few:

- You can customize the design of your letters and reports with integrated centering, bold facing, special tab features, mail merge capabilities, automatic page numbering, line lengths and much more.
- PIE:Writer is also compatible with both the Apple IIe and IBM Personal Computer and other popular compatibles.

The Hayden Advantage.

With thousands already in use, PIE:Writer is part of Hayden's growing "Personal Information Environment" family of software products. This includes PIE: Speller, a 20,000-word dictionary spelling checker with the ability to add user-specific dictionaries. You can expect some very exciting PIE additions in the near future. And naturally, full technical support from the company that has built its reputation on quality and service.

But don't take our word for it. Or the experts, either, for that matter. Try PIE:Writer for yourself and enjoy the ease and excitement of writing with the world's best word processor.

	Operating system(s) and/or machine(s)	Price	Overall Score
CPT #100	dedicated word processor*	\$15,000	94%
Dictaphone Dual Disp.	dedicated word processor*	\$13,500	85%
PIE:Writer	Apple II, IBM PC	\$149.95 \$199.95	84% 84%
WordStar	CP/M, Apple II, IBM PC	\$500	80
Easywriter	IBM PC**	\$175	35

- A tutorial section that easily acquaints you with the features of the program in step-by-step transactions.

*Includes word processing hardware & emulation support. **Requires additional CP/M hardware for your personal computer (IBM-486 extra). CPTM is a registered trademark of Digital Research. *VisiCalc is a registered trademark of VisiCorp. ***Very similar program called Easywriter Professional, available for the Apple II.

PIE:Writer

HAYDEN SOFTWARE

QuadDisk™ by Quadram™

Quadram™ presents QuadDisk™. The new hard-disk system.

QuadDisk gives you maximum storage capacity in the limited space you've got. Turning your IBM™ Personal Computer, PC XT, Compaq™ Chameleon,* or Eagle* computer into a micro powerhouse.

Choose from 6 to 72MB Fully Integral

QuadDisk comes in 6, 12, 20, 27, or 72 megabyte capacities. All integral to the computer for fast, convenient data access. And for added flexibility, there's QuadDisk with removable cartridges. For up to 6MB on-line storage plus added data security. (Not to mention virtually unlimited off-line storage.)



QuadDisk comes complete with disk controller board for total system integration.

Keep your personal computer personal

QuadDisk delivers all this power without turning your computer into a main frame. QuadDisk is compact. It installs in the same space as your floppy unit to become part of your system. Ready to work with your system.

By showing off its power, not its size, it keeps your personal computer personal.

Winchester technology made easy

But for all its power, this is one memory system that doesn't forget you're human. So QuadDisk comes with a virtual memory (RAM Drive) and a print spooler. Plus, QuadDisk's File Utility. To copy, rename, erase, and execute programs straight from a menu.

Without using complex DOS commands.

Quadram Quality

Every QuadDisk comes stamped with the Quadram Quality seal. The mark of dependability and performance from the leader in microcomputer enhancements. So visit your local computer retailer today. Ask to see QuadDisk in action. When a little space is all you have, QuadDisk by Quadram is all you need.



QuadDisk features removable cartridges which give you unlimited off-line storage. It's Winchester technology made easy.



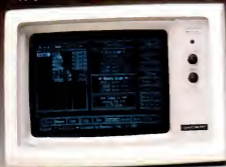
4355 International Blvd. Norcross, Ga 30093
(404) 923-6666 TWX 810-766-4815 (QUADRAM NCRS)

*IBM Personal Computer and PC XT are registered trademarks of the International Business Machines Corporation. Compaq is a trademark of the Compaq Computer Corporation. Chameleon is a product of the Seagate Computer Corporation. Eagle is a product of Eagle Computer, Inc.

CIRCLE 521 ON READER SERVICE CARD

As much storage capacity as you need, in as little space as you've got.

© Copyright 1983 Quadram Corporation All rights reserved



This software broker will step you through the arcane byways of commodities trading. Could there be a pork belly in your futures?

This Little PC Went To Market

Auto Trader

Avinco Corporation
P.O. Box 189
Sharpsburg, MD 21782
(301) 432-7118

List Price: \$795

Requires: 64K, one disk drive, color/graphics adapter, Epson MX-80 with GraphtraxPlus.

CIRCLE 618 ON READER SERVICE CARD

To most investors, the commodities market is an exotic no-man's land. The images that come to mind include a tight circle of screaming traders, a flurry of obscure hand signals, and a dark room with a highly polished table, around which are gathered the fabled gnomes of Zurich. This view of commodities trading is typified by the movie comedy *Trading Places* in which Dan Aykroyd and Eddie Murphy amass a tremendous fortune in a few short minutes of trading in orange juice futures. Every investor who has ever bought a stock, invested in a pork belly, or traded a baseball card in the hope of making an instant profit has secretly shared in the fantasy of this movie.

In actual practice, the various commodity markets serve the important busi-

ness function of allowing the commodity producer or commodity consumer to establish a fixed price that will be paid or received for a given commodity at a future date. The contract standardizes the quantity and quality of the commodity traded, and specifies the future month of delivery and the price to be paid. Unlike an option contract, which gives you the right to buy or sell at a given price, a futures contract commits you to buy or sell at that price.

Commodity markets initially were developed to satisfy the needs of food producers and are usually associated with foodstuffs and with precious metals. Some major exchanges are the Chicago Board of Trade (CBT) for grains, the New York Commodities Exchange (Comex) for metals, and the Chicago Mercantile Exchange for cattle and hogs.

In the past few years, an increasing number of financial futures markets have developed. The International Money Market (IMM) offers foreign currency futures, the CBT now offers government securities, and the Kansas City Board of Trade provides a futures market for the price of the Value Line Stock Index.

The Commodity Strategist

If you're ready to try your luck on the

commodity futures market, Avinco Corporation has put out a program called Auto Trader that makes specific recommendations on the buying and selling of commodity futures contracts. When supplied with a price history and a user-defined trading strategy, Auto Trader will print daily recommendations on each contract that you follow. It tells you the price at which to get in, and will subsequently indicate the price at which to get out to protect your profit or to minimize your loss. What's your part in this partnership? You simply decide whether to back its recommendations with your money.

The basic premise of Auto Trader is that market opportunities can be uncovered by comparing the day's trading range for a particular commodity with a closing-price moving average. A moving average is calculated by averaging the closing prices for a given number of days—you can choose to tally 5-day, 8-day, or 30-day averages. When this process is repeated using successive average closing prices, a moving average trend line can be drawn. Though this line will approximate the daily price line, it will smooth out the effect of price fluctuations on individual days. The greater the number of days included in the moving average calculation, the

greater its dampening effect. For example, a 5-day moving average will follow the daily price much more closely than a 30-day moving average.

Moving averages are widely used by technical analysts to highlight trends in particular markets. When a market changes direction, the actual price of the commodity will, at some point, cross the moving average. In a market that has been falling, this would be a good time to buy. Alternatively, the market may continue to fall, and the price rise that crossed the moving average may have indicated a merely temporary rally. In that case, it would have been an excellent time to sell or go short.

Trading Strategy

Auto Trader's recommendations are based on trading strategy that you define, and the application of that strategy to a price history. By comparing the daily price range to the moving average, Auto Trader will generate buy or sell recommendations.

The most important element in the trading strategy is your choice of how many days to include in the moving average. But there are other factors to consider as well. You must specify the number of days of price history to be examined. This enables you to exclude periods that you feel do not reflect current market behavior. You also may restrict Auto Trader to generate only buy or sell recommendations. This is useful if you are hedging a commodity that you already own, or if you are monitoring stock prices but do not wish to take short positions.

You also may specify an aggressiveness factor. Auto Trader's recommendations are always at a specific price (for instance, buy gold at \$425.50) rather than at market. Auto Trader apparently calculates an internal absolute price and uses the aggressiveness factor to establish a wider band (for the adventurous) or a narrower band (for the timid) around this price.

Once you enter a buy or sell position on a particular commodity, Auto Trader generates Stop Loss recommendations. It has a feature to base its stop prices on shorter-term moving averages than its Entry recommendations. This tends to protect profits by allowing you to sell out more quickly if the price reverses. It also has a provision to stand aside for a given

number of days after closing out a position. This gives you a chance to catch your breath, breathe a sigh of relief or regret, and watch which way the market moves next.

As you can see, the definition of the trading strategy is the crucial element in using Auto Trader. To help you in this endeavor, the system provides the Strategy Test report. It permits you to test a range of strategies over a desired period. You indicate the number of days to test and the high, low, and increment values for the moving average. Auto Trader will then tabulate the net results from the trades it would have made in this period, running through the various moving averages from the low to the high. For exam-

***By comparing
the daily price range to
the moving average,
Auto Trader will
generate buy or sell
recommendations.***

ple, if you specify 20, 8, and 4 as your high, low, and increment, you will see the net results using moving average values of 8, 12, 18, and 20.

The Package

The Auto Trader package contains a demonstration disk, an instruction manual, and a production disk enclosed in a plastic wrapper. The first page of the manual states that if you return the package within 10 days, with the production disk unopened, your purchase price will be refunded. The production disk contains a price history for five active contracts, current to the shipping date.

If a program can pick winning trades, I'm willing to be very forgiving about minor details of user friendliness. Unfortunately, I felt that Auto Trader required that I forgive quite a lot. Beginning with the demonstration disk and following the instruction manual, I attempted to open a new commodity contract. After several unsuccessful attempts, I discovered that the system accepts uppercase characters

only. The production disk corrects this problem by automatically setting the CapLock and NumLock keys and leaving them set when you exit.

Having created a file, I then began entering prices. The demonstration disk contains a price history for Dec 81 Corn, with prices through Dec 4. The prices to be entered are open, high, low, and close, along with a date. This routine will accept just about anything, including invalid or out-of-sequence dates, highs that are less than lows, and closing prices outside the day's trading range.

At the end of each set of prices, you are given an opportunity to correct the entries. There is also an extended edit function, which permits you to correct entries from prior days. In using this function with the demonstration program, I somehow clobbered the system's table of stored dates. At that point, all I could do was reboot the system and recopy the original files to my working disks. As I never encountered this problem in the production system, I contacted the manufacturer, who informed me that the coding for this feature on the demonstration disk is intended to prevent its being used as a production tool, but is not meant to wipe out the test files. He stated that he expected to correct this problem in future releases.

Auto Trader can generate very attractive plots of commodity prices and moving averages, either at the terminal or on an Epson printer with Graphtrax Plus. The documentation indicates that they will try to adapt the hard-copy plots to other printers. When plotting at the terminal, you can include the actual prices and one or two moving averages. Some people feel that significant market shifts are best found where two moving averages (say a 5-day and 30-day) cross. If you subscribe to this belief, then you'll love the plotting feature.

Since I wasn't particularly eager to experiment with Dec 81 Corn, I now switched to my production disk. This contained pre-established history files on current contracts for Corn, Hogs, Cattle, Gold, and T Bonds. When I listed the Auto Trader directory, I saw that none of these files had been established to the system. Since I had to set up the files anyway, I thought I might as well try to create some duplicate copies. Therefore, in addition to AUG GOLD, I created AUG #GOLD and AUG

MOVING AVE.	NUMBER OF TRADES	NET	BAL- ANCE OPEN	LOW	NO. PROFIT TRADES	AVE. PROF- IT	NO. LOSING TRADES	AVE. LOSS	LAST PRICE	TRADE: POSITION
4	9	-1815.01	-1885.01	-1815.01	3	378.33	6	379.17	448.50	SHORT
5	9	-1423.00	-1493.00	-1423.00	3	513.33	6	381.33	448.50	SHORT
6	7	1015.01	0.00	0.00	5	352.00	2	110.00	447.40	ASIDE
7	7	879.28	0.00	-45.00	5	330.86	2	125.00	446.23	ASIDE
8	5	1357.46	1577.46	-692.51	3	549.99	2	408.76	447.00	LONG
9	6	26.64	246.64	-2365.00	4	726.39	2	1214.45	447.00	LONG
10	6	-2777.01	-2540.00	-3461.00	1	1160.00	5	697.40	446.83	LONG
11	6	-2870.91	-2603.64	-3401.82	1	900.00	5	864.18	446.53	LONG
12	5	-3219.17	-2988.34	-3726.67	1	900.00	4	936.04	446.89	LONG
13	5	-2826.54	-2606.54	-3358.84	1	900.00	4	837.88	447.00	LONG
14	4	-621.44	-601.44	-2315.00	2	954.64	2	1215.36	447.00	LONG
15	3	1975.68	2195.68	0.00	2	1200.87	1	200.67	447.00	LONG
16	4	-2246.24	-2026.24	-2779.37	1	900.00	3	948.75	447.00	LONG
17	4	-2876.47	-2656.47	-3338.82	1	900.00	3	1158.82	447.00	LONG
18	4	-2896.12	-2676.12	-3320.00	1	900.00	3	1165.37	447.00	LONG

Auto Trader's Strategy Test report on author's trading in August Gold as of May 13.

83GL. The system accommodated this set-up, and it allowed me to run multiple strategies on the duplicate files. To establish the price history for these files, I simply copied the supplied AUGGOLD.DAT to new files, AUG83GO.DAT and AUG83GL.DAT.

Testing August Gold

I ran a number of tests on AUG GOLD and could not find a clearly advantageous trading strategy. The Strategy Test program provided little in the way of assistance in defining an effective strategy. The Strategy Test report shows results of trades, divided into profitable and losing trades, but you do not see the dates or prices of the individual recommendations. Thus you have no good way of assessing the relationship between a given strategy and a particular set of market conditions. Since your basic decision is whether or not to believe the recommendations generated by Auto Trader, the more information provided here, the higher will be your level of confidence.

I found this particularly true when a Strategy Test generated highly variable results. In testing a set of strategies for gold prices, I found an 8-day moving average generated a \$1,200 profit while a 10-day moving average generated a \$2,000 loss. Without additional detail, there is no way to gauge if this was luck or a significant difference in the moving average value.

When I entered parameters for the Strategy Test, the screen said to enter a number between 3 and 12 for the Stop

Layoff Interval, while the documentation said to enter a value between 0 and 4. When I used a value of 10, the system locked up, and I had to reboot to escape. After the parameters have been entered, you are asked if they are correct. If you respond by pressing N, the parameters are wiped out and you must re-enter all of them. Still, if the program can pick winners...

EXPECT
to spend a great deal of
time experimenting with
different test strategies
on different data
samples.

I finally reached the Daily Update and Trading module, the routine in which the current day's prices are entered and a recommendation, if any, is generated. At this point, I was processing late May price data for an August gold contract. The routine accepts the open, high, low and close prices for a contract and then generates its recommendation. If you do not yet have an established position, the recommendation will be to buy or sell at a particular price, or to stand aside (do nothing). If you already have a position, a stop price will


be recommended. Auto Trader will not increase a position you have already taken by recommending that you buy or sell an additional contract. After several days of trading recommendations, and having taken one small loss in buying gold, on May 24 I was advised to sell gold in all three of my test accounts.

Between May 27 and June 3, the price of gold fell by over \$40. Had I actually followed the recommendations provided by Auto Trader, I would have made a profit of over \$4,000 for each short position held during this period. Was it a lucky chance? As I've said, I'm willing to be quite forgiving about troublesome details.

A Good Idea, But...

The inability to find a consistent winning strategy for a particular commodity is not, of itself, a criticism of the program; it is, rather, a warning to the reader. Expect to spend a great deal of time experimenting with different test strategies on different data samples. If selecting a winning strategy were easy, there'd be a lot more rich commodity traders around.

I found it somewhat limiting that the recommendations were tied to the price entry routine. If you make a mistake that you don't catch until after the recommendation is generated, there does not appear to be any way to recreate the recommendation. Separating these functions also would provide some flexibility in testing what-if or within-day (before closing) conditions. You might want to enter mid-morning prices and see if any change in



**“TaskManager
has delivered
me from the
nightmare
of project-
tracking
paper-
work!”**

William T. Sand
Chief Engineer
Hathaway Corporation

If you manage people and jobs, coordinate due dates and juggle workloads, TaskManager can help you, too. This practical management tool lets you spot conflicts and overloads, balance schedules and ultimately get more done in less time. TaskManager produces reports and Gantt charts on the screen or on your printer. Hand TaskManager's concise charts right over to your department managers, project managers or assistants. They'll immediately know what to accomplish, when.

So get better organized—get the quick to learn, easy to use task managing system—TaskManager by Quala. For the IBM PC and compatible computers (PC-DOS 1.0, 1.1 and 2.0).

QualaTM

23026 Frisco Drive
Valencia, California 91355
(805) 255-2922

direction was indicated.

I would feel much more at ease if the recommendations were accompanied by an explanation of why a particular recommendation is made. The risks involved in an open commodities position can be substantial, and any information that can improve the confidence level of the system user would be most welcome.

My overall reaction to Auto Trader is that I like the idea, but I'm disappointed in its execution. The graphics and plotting functions are useful, but they can be obtained less expensively from several general-purpose graphics packages. The real reason for buying Auto Trader is for its predictions, and in this area I felt it adopted too much of a black-box approach.

WHEN A
market changes
direction, the actual
price of the
commodity will, at
some point, cross the
moving average.

While the operation of the package is well documented and quite easy to follow, the written documentation of the strategy parameters seemed purposefully vague and sketchy. This was carried through in both the Strategy Test report end in the actual recommendations.

Commodities trading is relatively high-risk investing. A great deal of money can be made or lost very quickly. If you put up the money for a package like Auto Trader, I think you should be provided with a lot more of the detail of what's happening inside. Your PC is a powerful analytic tool, but you'd better know what's being analyzed. Finding out the hard way could prove very expensive. /PC

Bruce Nissim has been an international banking consultant since 1976. His company, Nissim Associates, sells foreign exchange and multi-currency accounting systems for the IBM PC.



Introducing CompuServe's Executive Information Service

To Help the Over-Achiever Handle the Overload.

YOU,
YOUR IBM™ PC,
AND COMPUERVE,
MAKING
EXECUTIVE DECISIONS
TOGETHER.

If you're tired of having your answers questioned or waiting to have your questions answered, here's on-line support for you and your IBM™ PC, from the same communications professionals who provide business information services to over one fourth of the FORTUNE 500 companies.

CompuServe has more of the services and specific information that you need. For state of the art communications, you get InfoPlex™, the easy to use electronic mail service, and E-COM™ to link your PC to the U.S. Postal Service for quick, inexpensive hard copy delivery. For in-depth financial data, there's Value Line, Standard and Poor's, and

up-to-the-minute quotes plus current and historical information on over 50,000 companies and issues. Site-Potential™ is a demographic database that gives detailed census information and sales potential projections for any area of the country you choose.

The Executive News Service brings you the impressive resources of the Associated Press wire services along with a unique clipping capability that automatically selects articles on topics of your choice and stores them for your own "file."

There are professional forums, bulletin boards, the Official Airline Guide Electronic Edition, an on-line travel agency, and listings of airport delays.

And the new CompuServe software especially for the IBM PC makes this the simplest, most time efficient on-line service ever for the busy executive.

So, decide now to inquire about CompuServe's Executive Information Service. It makes every other decision a lot easier.

To get your CompuServe Executive Information Service Inquiry Kit, contact or call:



CompuServe

Executive Information Service
P.O. Box 20212
8000 Arlington Centre Blvd.
Columbus, Ohio 43220

800-848-8199
In Ohio, call 614-457-0802

CIRCLE 111 ON READER SERVICE CARD

THERE'S NOTHING EASIER UNDER THE SUN

Your personal
financial software
from Sundex.

IT'S EASY TO LEARN... EASY TO USE...

AND, DURING OUR SPECIAL PROMOTION... INCREDIBLY EASY TO BUY!!

- Control your finances and taxes with the Sundex Certified Personal Accountant™ program. With your financial status at your fingertips, easily analyze and manage your finances effectively. It even pays your bills automatically! Normally \$99.95 to \$149.95.

- Enjoy the ease and security of having your investment records on your Sundex Certified Personal Investor™ program. Ideal for personal portfolio management, analysis, and tax form preparation. Normally \$99.95 to \$149.95.

- Have fun with the Sundex Personal Payables™ program as it automatically pays all your bills from as many as 10 different checking accounts and prints out your checks. Normally \$49.95.

EASY TO LEARN ... EASY TO USE

5 minutes with a Sundex program will show you how "on screen" instructions plus a "HELP" key, make these programs so easy.

DURING OUR "SUNDOWN" PROMOTION ... INCREDIBLY EASY TO BUY!

Beginning October 31, 1983 and for 14 consecutive weeks, you will find Sundex Software in your local computer store for once-in-a-lifetime prices ...

STARTING AT \$19.95 ... BUT,
the prices go up every two weeks, so the sooner you buy the less you pay.

Test this remarkable software yourself. Ask your computer dealer to let you try a Sundex program. Then look for the colorful "Sundex Sundown" display, to find that week's price on the programs you want.

**HURRY ... DON'T LET THE SUN GO DOWN ON THIS
INCREDIBLE INTRODUCTORY OFFER!**

Visit your computer dealer today!

Just call 1-800-835-3243 to find out the name of the dealer nearest you.

THERE'S NOTHING EASIER UNDER THE SUN.

Dealer inquiries welcome:
1-800-835-3243
Colorado: 303-440-3600

Sundex Software Corp.
3000 Pearl Street
Boulder, Colorado 80301



CIRCLE 566 ON READER SERVICE CARD



AIR TRAX



**It's only a game . . .
but you can hardly tell the difference!!**

Begin your training at Raleigh-Durham airport as a junior Air Traffic Controller. Your job is to direct incoming traffic, maintain proper air separation, administer take-off and landing, and monitor transiting planes at suitable headings and altitudes. Your successes will bring you salary increases and job advancement to larger, more difficult airports. The ultimate success, of course, is to reach and then master the world's busiest airport, O'Hare in Chicago.

AIR TRAX is a sophisticated, real-time simulation featuring professional user-friendly documentation, multiple runways, game hold, six game speeds, small craft, jumbo jets, super-

sonic transports, fuel constraints, and 25 airport/traffic pattern combinations (both fixed and random) ranging from simple to impossible, including one you can design yourself.

To order AIR TRAX, call our toll-free number or send \$44.95 in the form of money order, certified check or cashiers check to: Control Concepts, P.O. Box 2367, Manassas, VA 22110. Make checks payable to 'Control Concepts.' If ordering by phone using VISA or Master Card, please have your credit card number and expiration date handy. Do not send cash. Control Concepts will pay for all shipping in the U.S.

CIRCLE 279 ON READER SERVICE CARD

CONTROL CONCEPTS

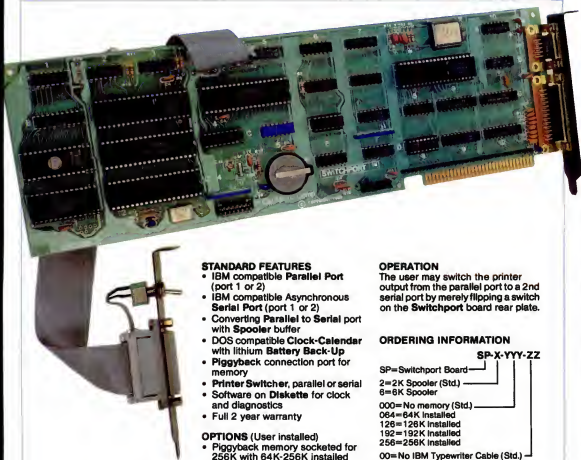
a division of PRESEARCH Incorporated

(800) 368-3078



SWITCHPORT

THE ULTIMATE ENHANCEMENT PRODUCT
FOR THE IBM PC OR XT



STANDARD FEATURES

- IBM compatible Parallel Port (port 1 or 2)
- IBM compatible Asynchronous Serial Port (port 1 or 2)
- Converting Parallel to Serial port with Spooler buffer
- DOS compatible Clock-Calendar with lithium Battery Back-Up
- Piggyback connection port for memory
- Printer Switcher, parallel or serial
- Software on Diskette for clock and diagnostics
- Full 2 year warranty

OPTIONS (User installed)

- Piggyback memory socketed for 256K with 64K-256K installed
- Special cable to connect IBM Electronic Typewriters as printers
- 8K Spooler memory (2K is standard)

OPERATION

The user may switch the printer output from the parallel port to a 2nd serial port by merely flipping a switch on the Switchport board rear plate.

ORDERING INFORMATION

SP-X-YYY-ZZ

SP=Switchport Board
2=2K Spooler (Std.)
8=8K Spooler
000=No memory (Std.)
064=64K Installed
126=126K Installed
192=192K Installed
256=256K Installed
00=No IBM Typewriter Cable (Std.)
50=Cable for IBM 50 or 60 Typewriter
65=Cable for IBM 65 or 85 Typewriter
75=Cable for IBM 75 Typewriter

Real estate agents and brokers in Santa Barbara, California, are discovering the advantages of desktop computing, IBM style, for tracking residential sales and managing properties, among other tasks.

The PC Moves Into Real Estate

The IBM Personal Computer has entered the real estate market in a big way. Across the United States, IBM PCs and XT's, as well as the PC compatibles, are showing up in real estate offices as the agents and brokers take advantage of the capabilities of desktop computing, IBM style.

The National Association of Realtors (NAR) and other state associations representing realtors have recognized the general movement toward computers and are now marketing real estate related software. Much of this software is written for the IBM PC, and a surprisingly large number of the products are demonstrated on IBM PCs.

Computers have become increasingly common in the business of buying and selling property. From the individual real estate office, the Board of Realtors, and the Multiple Listing Service, to the title companies (which handle the legal aspects of sales), and financial institutions, comput-

ers are processing thousands of bits and bytes of information for real estate transactions.

More and more of these transactions are processed through IBM PCs. The PC is viewed by many as the major force in getting the job done in real estate. It saves time in a professional, effective, and productive manner.

The local real estate market in California's coastal Santa Barbara area is a good example of the PC's widespread use in the real estate business. Individual offices and companies are using the PC and even the XT for everything from tracking residential sales and clients, to managing properties.

The Santa Barbara Board of Realtors has installed three IBM PCs to handle just about all of its administrative workload, including word processing, membership information, budgeting, financial projections, and bookkeeping. This computer-

ized administrative system has now become a model that other Boards of Realtors in the state of California are evaluating for implementation.

Administrative Applications

One real estate office in Santa Barbara is using the PC in many unique and creative ways. Gene O'Hagan Associates is a medium-sized office with approximately 12 agents. O'Hagan's Montecito office now utilizes the IBM PC to solve problems that are common to just about every real estate office.

Michael Baran, office manager of the company, has designed a complete administrative system based on the IBM PC. He keeps track of each agent's business by breaking it down into four categories: production, number of current listings, number of listings sold, and commission splits.

Commission splits, an area that was

once particularly troublesome, is now handled using Lotus' program 1-2-3. Once the data for the agents has been entered, 1-2-3 figures the commission schedules automatically.

"What makes commission splits so difficult to keep track of," says Baran, "is that commissions are based on production, volume, and other factors. Now, with a PC, keeping track of them doesn't take any time at all."

Keeping track of information is the focal point of Baran's job, and the PC is used primarily for that task. Using InfoStar by Micropro, Baran monitors each piece of property, how often it has been shown, its advertising and client-related costs, and other factors.

The result is that Baran easily can analyze the total picture, and answer the question: How much does it really cost to sell each house? Quick access to such information both impresses clients and shows the most effective way to market a

THERE ARE
times when we think
Michael will one day
sprout little antennas on
his head from all the
time he has spent setting
up this system.

piece of property. Administrative costs also can be kept down; advertising dollars are now spent more wisely.

Gene O'Hagan, the man who put up the money for the IBM PC system, sums up Baran's computerized office this way: "There are times when we think Michael

will one day sprout little antennas on his head from all the time he has spent setting up this system, but seriously, what he has created in the past few months has been a most effective communications and record-keeping system.

"We now keep track of everything on the PC. It's easier to plan in this business when you can find out instantly where you are, the status of any property, and the needs of any client."

Baran also uses WordStar with the PC as a tool to write all of the real estate ads and information sheets for the company. "You can be more professional, more efficient and do much, much more," Baran says, adding, "My own output has at least tripled since I've been using the IBM PC."

Accessing Multiple Listings

O'Hagan Associates is taking advantage of another aspect of today's computerized real estate world. Through the

Figure 1: A real estate agent can search for properties to match a client's specifications by using the Santa Barbara Board of Realtors' on-line Real Trieve system. This particular search resulted in 22 matches. The letter N, preceding the Multiple Listing Service numbers in the leftmost column, indicates a new listing. The rightmost column, PSFRW, indicates the presence of a Pool, Spa, Family room, parking for Recreational vehicle, and Wheelchair access, respectively.

```

FUNCTION* PR1
Project: Input
ENTER PROSPECT BELONG
404444

AGE OR DELETE RECORD* A
ADDRESS* 1415 CHAPALA STREET
PROPERTY TYPE* 1
ENTER ADDITIONAL SEARCH PARAMETERS (INIT "RETURN" WHEN DONE)
> 3600
> LPI=151,000-200,000
>

ADDED PROSPECT #10
AGE OR DELETE RECORD*

FUNCTION* PR3
Project: Input
ENTER PROSPECT NUMBER* 10

SEL. ALIENING
1415 CHAPALA STREET
95-1787

PROSPECT #10

L LISTING ADDRESS AREA PRICE OFFC BR BATH ST BAR PSFRW
N 1070145 7612 SANTA MARIA L 15 9125,000 124 1 1.5 1 2.0 Y Y
N 1070218 7542 CALLE NOBLES 15 9154,000 161 1 1.0 1 2.0 Y
N 1070321 1405 CAPELLA LA L 15 9034,679 393 2 2.0 1 2.0 Y
N 1070184 144 SAN JUAN R 15 9154,950 170 2 2.0 1 1.0 Y
N 1070447 690 COLUMB RD 15 9129,000 170 2 2.0 1 2.0 Y Y
N 1070912 625 PULGARONA ST S 15 9129,000 289 3 1.0 2 YEN Y
N 1071024 885 CLARK RD 15 9109,519 217 3 1.0 1 0 Y Y
N 1071201 581 MONTANA RD 15 9160,000 260 3 2.0 1 2.0 Y
N 1072201 3334 CALLE NOBLES 15 9169,000 276 2 2.0 1 2.0 Y
N 1072604 511 VIA ROJO 15 9167,000 289 3 2.0 1 2.0 Y
N 1074401 1932 LINCOLN ST 15 9169,000 149 3 1.5 1 YEN Y
N 1074404 477 MONTANA BR 15 9169,000 276 3 2.0 1 YEN Y
N 1078117 5 LAB AL LUGAR A 10 9169,900 210 3 2.0 2 2.0 Y
N 1080022 404 LA CLAYME RD 15 9169,900 295 3 2.5 1 2.0 Y
N 1070270 114 1845 ST E 15 9169,950 117 3 1.5 1 2.0 Y
N 1070447 3049 CALLE NOBLES 15 9173,900 168 2 2.0 1 0 Y
N 1075126 218 CALLE MONTANA 15 9175,500 134 3 2.0 1 2.0 Y Y
N 1075128 1741 DE LA PERALA 15 9176,500 224 3 2.0 1 0 Y
N 1076149 2677 MONTE ROY PL 15 9176,500 89 3 2.0 1 3.0 Y
N 1070214 2687 JORDAN PL 15 9187,000 31 3 2.0 2 2.0 Y Y Y
N 1070002 608 LUGAR REINADO 15 9188,000 98 3 2.0 1 2.0 Y
N 1071253 844 CHELSEA RD 15 9189,500 180 3 2.5 1 2.0 Y
  
```

NUMBER OF PROSPECTS FOUND = 22

Figure 2: An agent using the Amortization Schedule of the Santa Barbara Board of Realtors' on-line system need only type in AS to get started. The questions are self-explanatory and the answers provide information to prepare a complete and professional document, using the IBM PC.

```

FUNCTION* AS
Amortization Schedule
AMORTIZATION SCHEDULE
1. ENTER AMOUNT OF LOAN 1 50,000
2. ANNUAL INTEREST RATE 10
3. NO. OF PAYMENTS PER YEAR 12
4. TOTAL NUMBER OF PAYMENTS 1 60
5. PAYMENT AMOUNT (OPTIONAL) 2
6. BALLOON PAYMENT (OPTIONAL) 3
7. FIRST PAYMENT MONTH 1 12
8. FIRST PAYMENT YEAR 1 82
9. START PRINTING WITH YEAR 1
10. END SCHEDULE WITH YEAR 1 2
11. ANNUAL TOTALS ONLY (Y/N) 1 N
  
```

THE FOLLOWING DATA IS FOR INFORMATION PURPOSES ONLY AND THE ACCURACY OF THE FIGURES HEREIN IS NOT GUARANTEED.

MONTH	RENTAL	PAYMENT	INTEREST	PRINCIPAL	BALANCE
1	12/1/82	1062.33	416.67	645.66	43854.34
1982 TOTALS 1062.33 416.67 645.66					
2	1/1/83	1062.33	411.29	651.04	43103.30
3	2/1/83	1062.33	405.06	657.27	42346.03
4	3/1/83	1062.33	397.89	664.44	41581.59
5	4/1/83	1062.33	390.87	671.46	40810.13
6	5/1/83	1062.33	383.09	679.24	40030.89
7	6/1/83	1062.33	375.54	686.79	39244.10
8	7/1/83	1062.33	367.21	694.12	38450.98
9	8/1/83	1062.33	359.00	701.33	37650.65
10	9/1/83	1062.33	350.90	708.43	36843.22
11	10/1/83	1062.33	342.91	715.42	36028.80
12	11/1/83	1062.33	335.02	722.31	35207.49
1983 TOTALS 12746.20 4067.21 8680.99					

COMPU~~MAI~~

IBM PC & XT COMPLETE LINE

IBM PC 64K, Two disk drives 320K ea, Drive Controller & Color Graphics Card.

All for only \$2,599
IBM PC - XT also available

MONITORS

AMDEK

310-Green or Amber \$179

Color II Plus \$459

Color IV CALL

NEC MONITORS CALL

PRINCETON GRAPHICS

RGB Color Monitor \$449

QUADRAM

Quadchrome RGB Color \$449

PRINTERS: Dot Matrix & Letter Quality

BROTHER

HR-1 Parallel \$739

HR-1 Serial \$799

DYNAX

DX-15 Parallel Printer \$499

(Same as Brother HR-15)

EPSON

FX-100 \$799

FX-80 \$599

GEMINI 10 CALL

NEC

8023 AC \$449

SPINWRITER 3550 \$1,699

OKIDATA

Microline 93 \$839

Microline 92 \$499

QUME

Sprint 11 plus 40 cps \$1499



FLOPPY DISK DRIVES

CONTROL DATA - full height \$239

QUEM TRAK 142 - slim line... \$199

TANDON \$239

TEAC 55B slim line \$199

MULTI-FUNCTION BOARDS

AST RESEARCH

SIXPAK PLUS 64K \$269

GAME PORT \$40

COMBOPLUS 64K \$269

MEGAPLUS 64K \$269

MAYNARD ELECTRONICS

Multi function Card \$89

Memory Card \$179

Add on Modules CALL

MONTY CARLO CARD \$349

QUADRAM Quadboard 64K \$269

COMPAQ

10% OFF

NOW IN STOCK

HARD DISK SYSTEMS

IBM PC with 128K, one floppy Drive (320K) Internal 10MB Hard Disk, includes Controller, Power supply and software \$3999

Call for other custom configurations

HARD DISK DRIVES

DAVONG

10 MB Internal with Controller \$1599

21 MB Internal with Controller \$2399

TECMAR

5 MB Removable Cartridges .. \$1499

MODEMS

HAYES Modems

Smartmodem 1200 \$529

Smartmodem 1200 Card \$449

OTHER PRODUCTS FOR IBM

HERCULES Graphics Card ... \$399

MAYNARD ELECTRONICS

5.25" & 8" Drive Controller ... \$219

PLANTRONICS ColorPlus ... \$399

QUADRAM

Microfazer Printer Buffer 64K .. \$199

Quadlink Runs Apple Software on IBM PC \$499

TECMAR Graphics Master ... \$499

USI Multidisplay Card \$399

VERBATIM DSDD \$39

COMPU~~MAI~~

18653 VENTURA BLVD., TARZANA, CA 91356

CIRCLE 110 ON READER SERVICE CARD

(213) 783-5000

CIRCLE 110 ON READER SERVICE CARD

Board of Realtors, it is linked to a system called Real Trieve. This system, through the use of a modem, connects the IBM PC (or any other computer with an RS-232 serial port) directly to the Multiple Listing Service's main computer to take advantage of what is called "on-line access."

The system allows real estate offices to access more than 2,000 listings in the Multiple Listing Service. An individual real estate office, such as O'Hagan's, can hook into the system at any time of the day or night and obtain specific information to meet clients' needs.

Baran says that clients sitting in the office are impressed by the PC's ability to instantly search for property that meets the given specifications. To conduct a search with Real Trieve's on-line system, the agent signs on to the on-line system (see Figure 1) and types in PRI, which stands for Prospect Input. A password is then entered, followed by specific information about the client.

Say, for example, that the agent wants to search a particular district of Santa Barbara, which the on-line system has designated as area 15. The client is looking for a three-bedroom home in a \$150,000 to \$200,000 price range. Now that the specifications have been given, the agent enters PRS (for Prospect Search), which initiates the search. The result is 22 matches, shown in Figure 1.

This method of searching for property saves both the consumer and the real estate agent time. Details about the properties are listed in the printout (see Figure 1): the number of bedrooms and bathrooms, the size of the garage, the number of stories (single or two-story), and such extras as a swimming pool, a spa, a family room, recreational vehicle parking, and wheelchair access. Also, for the agent's convenience, the listing office is given.

The on-line system has many other capabilities, some of which are listed below.

- **Residential analysis**—Aimed at the first-time home buyer, this feature calculates the financial savings when tax breaks and equity build-up are taken into account.
- **Amortization schedules** (see Figure 2)—This feature enables the agent to show what the monthly mortgage payment will be, and how much of that payment applies to interest and principal, respectively. Year-end totals are also given.
- **Caravan lists**—A list of properties to be

shown. At any time the agent can printout a list of properties to be shown for the week.

- **Comparative market analysis**—With this report, an agent can show which properties have sold, which are currently on the market, and which listings have expired. The report can be used as a tool to generate computerized statistics that compare prices of a number of properties in a par-

U**SING THE** *on-line system to conduct a property search has a certain authority to it that going through the listings book just doesn't have.*

ticular area, and are used to determine which ones are priced competitively.

Says Baran, "Using the IBM PC to do comps (the comparable searches) means we don't have to go through the Multiple Listing Book. What used to take hours to accomplish can now literally be done in minutes on the PC through the on-line system."

Baran also points out an added benefit of using the on-line system: "Conducting property searches, comps, or even amortization schedules has a certain authority to it that going through the listings book just doesn't have."

The creative uses for the PC in real estate don't stop with the on-line system; in fact, they really just begin there.

Property Management

R. Peter Jackson, president of Mariposa Real Estate in Santa Barbara, is coming up with such innovative real estate and property management software for the PC that other realtors already have expressed interest, even though it is not commercially available.

Jackson, whose business operation covers both Santa Barbara and Ventura counties, started out with an IBM PC a year ago and recently added an IBM XT.

The programs that Jackson will soon market are actually overlays for dBase II. He also uses WordStar for his word processing needs and Multiplan by Microsoft for real estate analysis.

Through his special dBase II programs, Jackson keeps track of dozens of pieces of information on the over 1,000 units his company manages. Such items as tax assessor parcel numbers, insurance policy numbers, loan data with lenders, and homeowner association numbers can be searched for with this program.

One of the most unusual offshoots in Mariposa Real Estate's stable of property management software is a program Jackson uses to track down violators who park in the lots provided for the occupants of both his commercial and residential units.

"We have someone checking the parking lots from time to time, writing down license plate numbers," he says. "Then we plug all of that information into the XT to compare license numbers against what we have in our records. After four or five such surveys, we can tell if tenants or visitors are using the parking. From that point on we have control; the violators end up being towed away, while the tenants are happy."

When Jackson started with computers five years ago, he used a PolyMorphic system, but now he wouldn't trade his PC or XT for anything. He has the PC at home and the XT at work. "Work often gets to be a rat race, so it's nice to have the PC at home to do my creative work where it's quiet, away from ringing telephones," he said.

With the IBM XT, business runs smoothly at the Mariposa Real Estate offices, a fact that makes Jackson quite proud. He summarizes what the IBM PC and XT have done for him—and what they could do for anyone in real estate—in the following ways:

- **The machines allow him to train someone else to do the bulk of the company's work.** He gets results he wants without having to be there all the time.
- **Making changes with a PC is simple, so administrative tasks are carried out with greater speed and accuracy.** The PC and XT offer Jackson the opportunity to work more creatively. "There's a great deal of freedom," he says, "in not having to worry about the problems associated with the precomputer days—inserting paper into

What IBM won't tell you.

When it comes to manuals, IBM makes terrific computers.

But working your fingers to the bone soon takes the bloom off the rose.

So we've taken everything that you might even *think* you want to know about the IBM PC and compatible products and assembled it in one place.

The IBM PC Reference Encyclopedia.

This Second Edition of our Encyclopedia is two volumes jam-packed with information that gives you the meanings behind the manuals and keeps you current on compatible software and hardware products.

Inside, you'll find several thousand quick reference entries and over a hundred in-depth "how-to" items.

We'll tell you everything you need to know about DOS, (including 2.0). We cover the PC and the XT™ so thoroughly you won't need to buy the Technical and Hardware manuals. We detail topics like disk organization, printer control and more. Review IBM and non-IBM programs and add-ons realistically so you don't get trapped in the software/hardware jungle. And show you dozens of other ways to get the most out of your PC.



We've compiled tables and comparisons you won't find anywhere else. Gathered hundreds of practical tips and techniques from magazines, newsletters and dozens of experienced users, so you won't have to learn them the hard way.

It's easy to take.

We've made all this information easily accessible, because the Encyclopedia is efficiently indexed and thoroughly cross-referenced.

It's all explained in plain English with enough depth for both novices and experts.

We update it twice a year, to keep you up to speed on all the new developments.

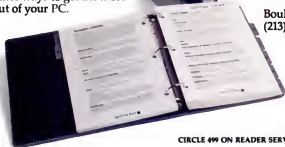
And it's all yours for a suggested retail price of just \$69.95.

Including 1 year of free updates.

So pick up a copy of the Ashton-Tate IBM PC Reference Encyclopedia (Second Edition) at your nearest computer or software store.

And stamp out manual labor today.

Ashton-Tate, 10150 West Jefferson Boulevard, Culver City, CA 90230.
(213) 204-5570.



ASHTON-TATE

IBM and XT are trademarks of International Business Machines.
© Ashton-Tate 1983

CIRCLE 499 ON READER SERVICE CARD



\$595⁰⁰

A modem that's compatible with all these and more.

Now you can get even more power from your personal computer or terminal.

How? It's simple. Just connect Cernetek's INFO-MATE™ 212A, intelligent auto-dialing modem to your PC or data terminal and then to the phone line and you're ready to communicate to the outside world.

Access data bases... send and receive electronic mail... make simple user-to-user connections... all at 1200, 300, or 110 bps, full duplex.

Modem Features:

- ▲ Auto-dial, auto-answer

- ▲ Recognizes dial, busy, ring back, modem answer tone and the human voice
- ▲ Stores 52 32-digit phone numbers or log-on messages
- ▲ Auto-speed and parity select
- ▲ Auto-selection of tone or pulse dialing
- ▲ Bell 212A and Bell 103 compatible
- ▲ RS 232C serial interface

Just call us at (408) 734-8150 for your nearest dealer location. Dealer and distributor inquiries invited.

See Us At COMDEX Booth 4840

Our special offer to you: \$195 in CROSSTALK™ software for just \$95 with purchase of INFO-MATE 212A* *Subject to availability



Cernetek
microelectronics

CIRCLE 215 ON READER SERVICE CARD

SOLOMON III GENERAL LEDGER

Has The Key Features You Want. And We Can Prove It!

CPA's designed Solomon III General Ledger with features you need most. Such as graphically displayed screens, user definable chart of accounts, reports, journal types and budgets, and extremely clear audit trails.

Solomon III General Ledger allows for consolidation of multi divisions or companies (at the same or different locations), user definable auto reversing and recurring transactions and account numbers up to 12 digits long.

And it's not just what Solomon III does that's impressive — it's how Solomon does it. Because no other general ledger program takes advantage of the capabilities of your IBM Personal Computer™ the way Solomon III General Ledger does.

Contact your authorized IBM PC dealer or call us today for your Solomon demo.

COMPUTECH



COMPUTECH GROUP INCORPORATED

Main Line Industrial Park
Lee Boulevard
Frazier, PA 19355
215-644-3344 • 215-SOLOMON
or
24160 Haggerty Rd.
Farmington Hills, MI 48024

Solomon III General Ledger Features and Specifications:

Features:

- On screen review of account balances
- On line HELP
- Password protection
- Period and/or annual budgeting
- User definable accounting cycles up to 13 periods
- Transactions allowed against prior periods
- Retain transaction detail year to date option
- Easy to use Financial Reporter Generator for user defined reports
- Consolidation of open, inactive accounts on financial statements

Reports:

- Reports by profit centers, divisions, regions or other defined areas
- General reports for any period in last year
- Maintenance reports on reports to chart of accounts
- Ratio Analysis Report
- Interfaces with other programs

Specifications:

- Hardware Requirements: IBM Personal Computer or PC XT or compatible
- Memory: 256 K RAM
- Printer: 132 Columns
- Disk Drives: 1 320 K floppy or 1 320 K floppy with hard disk (recommended)

Operating System: PC DOS

(other versions to come)

Documentation:

- Complete, clear easy to use and understand

Other:

- Built around MDBS III* database management system
- Can be fully integrated with other Solomon III sub systems (Accounts Payable, Accounts Receivable, Payroll, Inventory Order Entry/Invoicing, Job Costing, Purchasing or Fixed Assets)

Price:

- \$595.00 complete



Solomon Series Software is a registered trademark of TLB, Inc.
IBM Personal Computer, PC-XT and PC-DOS are registered trademarks of IBM.
MDBS III is a registered trademark of Micro Data Base Systems, Inc.

CIRCLE 173 ON READER SERVICE CARD

1984 Business Activity Planner

Imagine! A complete Appointment Book, Financial Record Keeping System, Travel Information Guide, Health and Fitness Aid and Directory...All in one book!

No matter how organized and successful you are today, our Planner will make you even better in the future...or your money back!

**IT'S A
GREAT
GIFT
IDEA,
TOO!**

IT'S AN APPOINTMENT BOOK! SEE-A-WEEK CALENDAR

■ A full week... at a glance! Time planning becomes easy when your appointments, meetings, luncheon and dinner engagements and special activities are in front of you.

HALF-HOUR TIME SCHEDULING

■ Convenient scheduling... seven days a week.

THINGS TO DO TODAY

■ Keep track of important follow-ups, telephone calls and correspondence.

SEVEN SNAP-LOCK RINGS

■ The seven ring format insures that your pages won't pull out... unless you want them to!

BEAUTIFUL, SOFT, LEATHER-LIKE BINDER

■ Padded front and back, your 9 1/2 x 11 1/2" Planner is comfortable to carry. You can take it with you wherever you go. The sturdy, permanent bookmark always keeps you in the right week and the two inside pockets enable you to keep all your important papers in your 1984 Activity Planner.

YOUR CHOICE OF IMPRINTS

■ Order the 1984 Business Activity Planner for everyone in your office... and select the cover imprint for

each person! Available with Business Activity Planner, Chairman of the Board Activity Planner, Executive Woman Activity Planner, or Executive Activity Planner.

IT'S MUCH MORE!

■ Each Section is Index-Tabbed for Instant Retrieval of Information.

FINANCIAL RECORD KEEPER

- 12 Income and Expense Reports
- 1984 Business Tax Calendar
- Executive Compensation Checklist
- Personal Investment Portfolio

HEALTH AND FITNESS AID

- Fat - Cholesterol - Calorie Charts
- Value of Various Exercises

- Substitution Chart for Better Health
- First Aid Tips

TRAVEL INFORMATION

- Average Temperatures for Most Major Cities
- Rank and Population of the Top 100 U.S. Cities
- Traveling Distances
- Toll-Free Telephone Numbers for Major Airlines, Auto Rentals, Hotels, Motels and much more!

MISCELLANEOUS

This section is filled with valuable information including Principal Holidays, French and California Wine Vintage Charts and more.

DIRECTORY

Places all emergency and important telephone numbers at your fingertips.

ZIFF-DAVIS ACTIVITY PLANNER

P.O. Box 16-2354, Miami, FL 33116
Please send me the following 1984 Activity Planners at \$38.95* each plus \$5 per copy postage and handling. Outside U.S.A. add \$10 per copy postage and handling.

Specify quantity for each cover imprint ordered:

- ___ Business Activity Planners)
- ___ Chairman of the Board Activity Planners)
- ___ Executive Woman Activity Planners)
- ___ Executive Activity Planners)

QUANTITY DISCOUNTS (on total number of Planners)

6-20	10% off	(\$4 P&H each)
21-50	15% off	(\$3 P&H each)
51-or more	20% off	(\$2 P&H each)

☐ Payment enclosed. ☐ American Express ☐ Visa ☐ MasterCard ☐ Purchase Order enclosed.

Card No. _____ Exp. Date _____

Signature _____

Name _____

Company _____ (please print)

Address _____

City/State/Zip _____

*Florida residents add 5% sales tax.

SATISFACTION GUARANTEED or return

PC11 within 10 days for a prompt refund!

FOR FASTER SERVICE CALL TOLL FREE

800-327-1969

(In Fla. and Canada call (305) 595-8744.)

COHERENT™ IS SUPERIOR TO UNIX* AND IT'S AVAILABLE TODAY ON THE IBM PC.

Mark Williams Company hasn't just taken a mini-computer operating system, like UNIX, and ported it to the PC. We wrote COHERENT ourselves. We were able to bring UNIX capability to the PC with the PC in mind, making it the most efficient personal computer work station available at an unbelievable price.

For the first time you get a multi-user, multitasking operating system on your IBM PC. Because COHERENT is UNIX-compatible, UNIX software will run on the PC under COHERENT.

The software system includes a C-compiler and over 100 utilities, all for \$500. Similar environments cost thousands more.

COHERENT on the IBM PC requires a hard disk and 256K memory. It's available on the IBM XT, and Tecmar, Davong and Corvus hard disks.

Available now. For additional information, call or write,

Mark Williams Company
1430 West Wrightwood, Chicago, Illinois 60614
312/472-6659



COHERENT is a trademark of Mark Williams Company.
*UNIX is a trademark of Bell Laboratories.

CIRCLE 391 ON READER SERVICE CARD



IN THE BEGINNING THERE WERE SPREADSHEETS... NOW PROFIN™ GOES BEYOND.

If you're a very busy person wondering why it should take hours to set up the mathematical calculations for financial analysis on a microcomputer, the answer is it shouldn't.

If you think there should be some way to see income statements, interest schedules, capital expenditure reports, tax schedules, return on equity, discounted cashflow, and balance sheets without spending days laying out a spreadsheet, you're right—there should.

In fact, there is! It's Profin.™

MATCHING THE TOOL TO THE JOB.

From now on, using a universal spreadsheet to do the highly specific work of financial analysis will be considered just fun for hobbyists.

But, if you're a business person with little computer experience and even less spare time, you can quickly and easily use Profin to figure forecasts and budgets, return on equity, discounted cashflows, net present values, capital expenditure, interest calculations, depreciation comparisons and taxation scheduling—with the reports laid out for you automatically.

FINANCIAL REPORTS IN MINUTES.

Because Profin is menu-driven, you simply answer a series of questions. You can complete your analysis

in 30 minutes, or change prices, costs, inflation rates, interest rates, capital costs, and foreign exchange rates, then immediately see revised reports.

In the beginning, spreadsheets were great. At least, they were all we had. Now there's more, with the specialized tool for a specialized job: Profin.

Available under \$300 for CP/M-80, MS DOS, and IBM PC-DOS from your local retailer or from most distributors.

Also available: Profin™ For sales, marketing and other executives who just want simple forecasts and budgets without detailed capital and loan analysis, Profin gives you operating income statements plus net income and discounted cashflow reports in less than 15 minutes. Under \$200.

**BUSINESS™
SOFTWARE**

☐ Please send me more information about how Profin and Profin beat the spreadsheets for budgets and forecasts.

Name

Address

City/State/Zip

Computer Brand Owned or Planned to Buy

Mail to: Business Software, Inc.

12021 Wilshire Blvd. #194

Los Angeles, CA 90025

\$299



Why pay more for a 1200 baud, auto-dial, 212A Modem for your IBM PC?

Flip the pages. You see PC modem cards with fewer features advertised for as much as \$599. Up until now that's how much it cost to make a modem capable of transmitting at 120 characters per second (1200 baud). It doesn't take a computer to figure out the savings in phone line charges when you communicate four times faster than the 30 character per second modems (300 baud). Now you can have the solution to your communication needs at an unheard of price.

NOW COME THE SMART GUYS

You can imagine how precise the components had to be to convert tones over a phone line into characters. Precision equates to cost. With the advent of the mass market in personal computers the economics of scale drove the costs of manufacture down but did not effect the precision required. The technology used is called "analog filtering". It is the process of sending (modulating) and receiving (demodulating) tones with perfect pitch. A lot of adjusting, noise suppression, and a little magic is required. Real expensive. Some use lots of chips and filters (known as discrete components). The latest rage is LSI (Large Scale Integration) technology. Which is the same old analog stuff condensed onto fewer chips.

A NEW IDEA

We took a different approach. With the Qubie PC modem card you can say goodbye to the fellow who delivers your ice because refrigeration has been invented. Through the use of four microprocessors (see picture) the tones are chopped up digitally and measured millions of times per second, eliminating the need for analog circuitry. Two microprocessors do the modulating, two the demodulating. The chips are programmed to emulate the 103 (30 characters per second) or 212 (210 characters per second) standards and determine the correct speed automatically. It's a proven technology that provides outstanding performance. Best of all, it's inexpensive and reliable.

NO CORNERS CUT

We included every feature you would want in a modem card. It plugs into your IBM PC or XT and occupies any one slot since it is just 8/10 of an inch thick. This card comes with its own asynchronous port. If you would like to use the async port for another peripheral when your modem is not in use, we will add a connector for just \$20. It's FCC registered for direct connection to your modular phone jack with the cable which is

included. There is a separate jack for your telephone or you can listen through the board's speaker. It operates in full or half duplex mode on Rotary dial lines (pulse dialing) or on tone lines (DTMF), or a combination of both. It will work in originate or auto-answer modes. A separate microprocessor, a Z8, controls all the functions.



LET'S TALK SOFTWARE

Our modem is 100% compatible with the Hayes software commands so you can use any of the popular communications packages like Cross-Talk, Transend, or PC Modem. We go one better than the competition. We include one of these popular programs with your modem, PC-TALK III. PC WORLD magazine referred to it as "the benchmark that other PC communications packages are measured against." It stores phone numbers, log-on information, handles setting the modems characteristics, saves to disk files, transmits from disk files, even binary files. And to make sure data is sent and received accurately, there is the XMODEM protocol which detects errors caused by poor line quality and retransmits the data.

WHY BUY FROM US

Because besides having the most advanced product on the market, we stand behind it and you. If at any time during the one year warranty period your modem should require service, we will fix or replace it within 48 hours. Notice also there are no hidden charges in our price. Nothing extra for credit cards or COD charges. We even pay UPS to deliver to you. If you still are

not convinced, and are ready to buy another brand of modem, ask them if their product can take our acid test.

THE ACID TEST

Qubie's gives you a 30 day satisfaction guarantee on your modem. If you are not completely satisfied we will refund the entire amount of your purchase including the postage to return it. If you can, get any of our competitors to give you the same guarantee. Buy any modem you like and return the one you don't like. We know which one you will keep.

WHY PAY MORE?

We don't have a clue. It's all here. A high quality, full featured, communications package at a price that used to be reserved for 300 baud modems. But if you decide to spend an extra \$200 or \$300, we would sure like to hear why. We have spent lots of time thinking about it, and frankly, we just can't come up with a reason.

TO ORDER BY MAIL SEND

- Your name and shipping address
- Daytime phone number
- California residents add 6% sales tax
- Company check or credit card number
- With expiration date. (Personal checks take 15 days to clear)
- Specify single or double sided disk drive



TO ORDER BY PHONE

Call (805) 987-9741

PRICE:

\$299 includes 300/1200 Baud Direct-Connect modem card, PC-TALK III Software, cable to connect to modular phone jack, installation instructions and manual 1 year limited warranty.

External async port connector \$20

Cable for Serial port to printer \$25

SHIPMENT

We pay UPS surface charges. UPS 2 day air service add \$5 extra. Credit card or bank check orders shipped next day.

QUBIE'
DISTRIBUTING

4809 Calle Alto
Camarillo, CA 93010
(805) 987-9741

And you thought the IBM PC was only for business.

It was.

Until Mirror Images began designing computer games especially for the IBM PC.

Spyder is a fast-paced arcade-style game that pits you against an army of fierce, hungry spiders. Blast them with your laser gun. Or stomp on them as they come your way. **\$39.95**

If you've ever dreamed of commanding a star cruiser, **Tachyon** is your game. As commander of The Avenger, your mission is to destroy the Galyon fleet with your computer-driven torpedoes and lasers before the enemy penetrates your shields and destroys your ship. **\$39.95**

You'll need cunning strategy to beat the computer at **Hide and Sink**. A naval battle waged by subs, PT boats, cruisers, destroyers, and battleships rages on your screen. Hide your ships carefully. Then seek out and destroy the enemy with your guns and missiles. **\$29.95**

And so we tempt you to take a well-deserved break from the day's stress and frustration. Then you may straighten your tie and head back to the board room. Completely refreshed and invigorated!

Contact your local dealer or send a check or money order to Mirror Images. Please include \$1.50 for postage and handling. NY residents add 7% sales tax. Credit card orders are also welcome.

Dealer inquiries welcome.

Requires 64K, DOS 1.1, color graphics adapter. Tachyon: double-sided drive, Spyder, Hide and Sink: single-sided drive.

IBM is a trademark of International Business Machines Corp. Tachyon, Spyder and Hide and Sink are all registered trademarks of Mirror Images Software, Inc.

See us at PC '83, Booth no. B 121

**MIRROR
IMAGES**

Mirror Images Software, Inc.
Games Division
1223 Peoples Avenue
Troy, New York 12180
Telephone: (518) 274-2335



SPYDER™



TACHYON™



HIDE AND SINK™



TDK Floppy Disks. Invaluable security for irreplaceable information.

Today, more and more companies are relying on convenient floppy disks to record, store and safeguard information. Irreplaceable information which is vital to their business interests. It is precisely the value placed on this information that makes the floppy disk an invaluable tool for storage and security. And this is where TDK floppy disks become invaluable to you. TDK floppy disks are guaranteed 100% error-free at the time of manufacture and certified for double-density encoding. Furthermore, each track of every TDK floppy disk is tested to exceed industry standards... including those of IBM, Shugart, ANSI, ECMA, ISO and JIS. Once you insert a quality TDK floppy disk into your computer system, you're guaranteed highly reliable, ultra smooth performance. This is due to TDK's proprietary disk-burnishing technique that provides optimum head-to-disk contact.

TDK floppy disks are available in 5 1/4 and 8-inch sizes in the most popular formats. Each copy comes in its own protective Tyvek-type envelope. For a copy of our brochure, "Some Straight Talk About Floppy Disks," write to: TDK Electronics Corp., Computer Products Marketing Dept., 12 Harbor Park Drive, Port Washington, NY 11050, or call 516-625-0100.



**Hardware
& Peripherals**

	RETAIL PRICE	MICRO FLASH
AST Research MegaPlus 64K	\$395.00	\$279.95
64K Ramchip Sets	100.00	64.00
Anchor Automation Mark VII Modem	279.00	199.95
CDC 9409 320K Disk Drive	525.00	259.95
Davong 10 MB External Hard Disk	2,395.00	1774.95
Hayes Smartmodem 1200	699.00	496.95
Hayes Smartmodem 1200B	599.00	479.95
Hercules Graphics Card	499.00	399.95
Koala Pad Touch Tablet	124.95	99.95
Microsoft® The Mouse™	195.00	139.95
Microsoft® 64K SystemCard™	395.00	269.95
Pantronics ColorPlus	495.00	379.95
Parasonic 1/2 Height 320K Drive	395.00	239.95
Printers (Epson, Oki, NEC, Datsywriter, Diablo, TTX, Others)		SCALLS
Princeton Graphics HX-12 Monitor	680.00	539.95
Quadram QuadLink	680.00	499.95
Seattle RAM +3 Card	295.00	229.95
Seattle 8087 Package	395.00	309.95
London TM100-2 320K Drive	500.00	249.95
Diskettes - 3M, Dysan, Others		SCALLS

Software

Alpha Data Base Manager II	\$295.00	\$219.95
Ashion Tale dBase II	700.00	399.95
Friday	295.00	199.95
Financial Planner	700.00	399.95
Bottom Line Strategist	400.00	299.95
BPI Personal Accounting	195.00	149.95
Continental Ultrafile	195.00	124.95
Home Accountant Plus	150.00	94.95
TCM	125.00	93.95
DesignWare Spellchecker	39.95	29.95
Digital Research CP/M 86	65.00	44.95
Concurrent CP/M 86	350.00	279.95
Eagle Money Decisions Pac.	399.00	299.95

Software Continued

	RETAIL PRICE	MICRO FLASH
Financier Personal Series	195.00	154.95
Fox & Geller QUICKCODE	295.00	189.95
dUTIL	99.00	74.95
dGraph	295.00	189.95
Innovative Fast Graphs	295.00	221.95
T.I.M. II	495.00	371.95
Lifetree Volkswriter	195.00	123.95
Volkswriter International	225.00	179.95
Volkswriter Deluxe		SCALLS
Link Systems DataFax	299.00	239.95
MicroPro WordStar	495.00	249.95
Infostart	495.00	249.95
WordStar Professional	695.00	389.95
Microsoft®		
Multi-Tool Word™	395.00	279.95
Multi-Tool Word with The Mouse™	495.00	349.95
Multipan MS-DOS™	275.00	195.95
Multi-Tool Financial Statement™	100.00	79.95
Multi-Tool Budget Analysis™	150.00	115.95
Basic Interpreter™	350.00	244.95
Basic Compiler	395.00	279.95
Business Basic Compiler	600.00	419.95
C-Compiler	500.00	349.95
Pascal Compiler	350.00	244.95
Cobol Compiler	750.00	524.95
Fortran Compiler	350.00	244.95
Oasis The Word Plus	150.00	129.95
RoseSoft ProKey	75.00	64.95
Sector Project Scheduler	285.00	229.95
Sorcom SuperCalc II	195.00	154.95
Software Arts TK! Solver	299.00	229.95
TK! SolverPacks	100.00	84.95
Software Publishing PFS File	140.00	104.95
PFS Report	125.00	99.95
PFS Graph	140.00	99.95
PFS Write	140.00	99.95
SoftWord Systems MultiMate	495.00	329.95
Stoneware DB Master Advanced Ver. ..	595.00	419.95

To order call:

**800/458-2433**

(outside California)

For price quotes, information, technical
support, and California orders call:**415/680-1157**

Low Prices • Lightning Service!

YOU know that Micro Flash is not just a "flash in the pan"... We are the same company that you smart corporate buyers have been finding in the back of the book for the last two years! YOU have helped us to build our reputation. YOU know that Micro Flash Computer Systems has provided excellent customer service, fast delivery of your orders, and knowledgeable consultation and technical support when you needed it. Don't you think it's time that others knew? To order from Micro Flash, simply call one of our order lines and charge it to your



MasterCard or VISA. We add no credit card surcharge! (We also accept purchase orders from qualified institutions. Call our credit manager.) You pay a flat \$6.00 per order for shipping, handling and insurance, with the exception of printers and monitors. UPS 2nd Day Air Service is just \$3.00 more. Our local customers can call their orders at our new Concord offices. We welcome mail orders accompanied by Certified or Cashier's checks. Micro Flash Computer Systems has made it simple for YOU to do business with us!

CIRCLE 315 ON READER SERVICE CARD

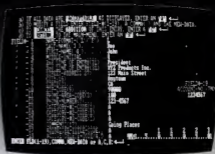
■ COMPUTER SYSTEMS ■

1110 Burnett Avenue, Suite K Concord, CA 94520

What do the thirteen most popular word processors have in common?



Easywriter* Superwriter*
Multimate* Wordperfect*
Perfectwriter* Word Plus*
Powertext* Wordstar*
Select* Visiword*
Spellbinder* Volkswriter*
Executive Secretary*



CataList™

The most versatile list and file manager for the IBM PC.

CataList is a menu-driven, mini-database, list processor, file management, and mailing list handler.

CataList prepares fully-compatible interface-diskettes for any of the 13 most popular word processors. No programming experience is required.

CataList is flexible and easy to use; it lets the user merge CataList interface diskettes with "customized" form-letters created by your word processing system.

Other CataList features:

- Select or delete items by name, partial name, nine-digit zip code, record number, date of entry, or any of 16 other user-defined fields or partial fields.
- Choose from six standard, built-in sort routines, five user-defined variable sort fields, and up to 21 fixed-length fields for sorting.
- Process nearly 2,000 entries per data diskette for an unlimited number of diskettes, and retrieve entries by name, partial name or record number in less than two seconds (up to 32,000 entries on the XT version).
- Browse through information with single key (forward or backward, with wraparound).
- Suppress printing or displaying of confidential data, on any or all fields.
- Perform sum of numeric data.
- Handle Canadian, U.K. and European addresses, alpha-numeric zip codes, and telephone numbers.
- Use 26 coded addressee-titles, 15 of which are user-defined (useful for foreign and other titles).
- Print up to eight labels across and up to 99 copies per each entry selected.
- Produce listings, labels, envelopes, and two different sizes of Rolodex cards.

CataList will access the following printers:

BROTHER HR-1/DX-15* NEC-8023/3500/7700 SERIES*
COMREX CR-1* INFOSCRIBE 1000/1100/1200/1500*
DAISYWRITER-2000* EPSON MX/FX-SERIES*
DIABLO-620/630* IDS 460/480/560 PRISM*
GEMINI/STAR-10* TRANSTAR T-140*
QUME SPRINT* OKIDATA 84A/92/93*
C.I.TOH M-8510A F10-55 AND F10-40* FUJITSU-F86*

System requirements for the IBM PC*, IBM PCXT*, and Compaq*:

- 128K RAM, DOS 1.1 or 2.0
- two double-sided diskette drives (320 KB each)
- printer and word processor optional
- any monitor (color or black and white)

- CataList User Manual, Tutorial Demo Diskette, and CataList Diskette — \$195
- Tutorial Demo Diskette Only — \$15
- User Manual Only — \$75

(Postage and tax included. No charge for credit card.)

To order, send check or money order to:

STONE and Associates
Software Publishing and Marketing, Inc.
7910 Ivanhoe Avenue, Suite 319
La Jolla, CA 92037
or VISA/MC call 619-459-9173(CA)
800-624-2262(NAT)



Dealer orders call VITEK
800-237-7290 (CA) 800-237-3443 (NAT)

Due to the rapid automation of library records, you and your PC can now access the collective catalogs of most of the world's major libraries.

Library Automation Reaches Out To The PC

The next time you find yourself in a library, take a good look at the card catalog, because its days are numbered. Some day you might like to tell your grandchildren how you used to track down books in the library.

The present-day card catalog, first introduced in the 1860s, is a remarkable information storage and retrieval device. It provides random access to a large amount of data (over 20 million records in the case of the Library of Congress), handles foreign language character sets, is easy to update, and allows access from a number of points. But the well-worn brass-handled oak drawers are giving way to the newer technology of the microcomputer.

PC owners will soon have access not only to the catalog of the local library but to the collective catalogs of most of the world's major libraries. From your home computer, you will be able to tell whether your local library has an item, if it is in or out on loan, and where it can be found. An inter-library loan system will allow you to

order the book to be sent to your local library. Much of this technology is currently in use by librarians and eventually will be extended to individual users.

P_C OWNERS
*will soon have access to
the collective catalogs of
most of the world's
major libraries.*

But the first step in the process, automating the library catalog, isn't easy. Imagine, if you will, the following exchange of memos:

MEMO

From: J.Q. Mogul, President
Mogul Industries Incorporated

To: Charlie Programmer

We have just acquired the financially faltering North Southwest State University, and we've made the library a part of the research division. To improve operations, I would like you to write a database system for the new division. An IBM XT will be on your desk tomorrow. Here are the requirements:

- Records can range from 200 to 12,000 characters in length;

- Most fields have to be variable length;

- The system must support character sets for more than 250 languages, some of which read from left to right, some from right to left, some from top to bottom;

- In addition to books and journals, the system must handle photographs, maps, music scores, audio recordings, films, letters, manuscripts, videotapes, computer programs, and data files;

- The system must be able to handle upwards of 10 million records. You'll have to arrange for the retrospective keying of all those that already exist.

I'll check with you in a couple of weeks to see how you are doing.

MEMO

From: C. Programmer

To: J.Q. Mogul

Do we really need Chinese?

Automating the Data

Such a system is just part of what American libraries have achieved over the past 20 years. The history of library automation begins much earlier. Perhaps the single most important element was the development in the early 60s of a standard record format for bibliographic materials—the Library of Congress' Machine Readable Catalog (MARC). The record format description in itself would make a fair-sized book.

The main thrust of the project, under the direction of Henriette Avram, was to provide a means to transfer machine readable records via magnetic tapes to other libraries, enabling them to produce their own catalog cards. In 1967, Frederick Kilgour founded a library cooperative providing access to the machine readable records via a computer terminal. Members either took the existing record, modified it if necessary, and had the cards printed and shipped out to them, or they created a new record that other libraries could use as a cataloging record. This system, known as the Online Computer Library Center (OCLC) has now grown into a nationwide network of over 3,000 participating libraries. The database consists of over 10 million records, and contains the cataloging information in the MARC format. Also, it indicates which of the member libraries holds the work. The OCLC facility, located near Columbus, Ohio, gives the impression of a football field covered with disk drives. The OCLC database claims the distinction of being either the largest or the second largest on the planet, depending on the unknown size of the Central Intelligence Agency and National Security Agency databases.

What started as a cooperative for shared cataloging now has become a large collective catalog of the member libraries. It is a national resource, in that the 10 million records (in the MARC format) include most of the materials in the member libraries. For shared cataloging, it is estimated that about 90 to 95 percent of new acqui-

sitions can be cataloged from records already in the OCLC file. Efforts are now under way to provide subject access to the material, and an inter-library loan system allows member libraries to make requests directly over the network.

More recently, a new library network

SOME
libraries have coin-operated PCs, which are used just like the coin-operated copy machines.

was created to serve the special needs of the nation's largest research libraries. The Research Libraries Information Network (RLIN) maintains a database with each member library's holdings tagged so that each can maintain its own online catalog within the system. RLIN, after a somewhat rocky start, is now serving a number of major research libraries. Based at Stanford University, the system has over 4 million catalog records. (The Washington Library Network is a similar database system, and the University of Toronto Library Automation System serves Canada.)

Microcomputer Access

Everyone now agrees that the key to the future exploitation of these national bibliographic networks is the microcomputer. The recent selection of the IBM PC as the approved terminal for OCLC assures a prominent place for IBM microcomputers. What remains is providing access to the public. Richard McCoy, the new president of RLIN, said in a recent interview, "Microcomputers are probably the single most important development for us. It will be the demands created by those computers that will have much to do with the way in which the information resources, of which libraries are a part, develop." McCoy added that thousands of individual computers are "breaking down our electronic doors to get at the library databases."

This demand spurred several projects

presently underway, most at The University of Michigan, devoted to developing software to interface the IBM PC with the online catalog. The PC user can go directly from the online catalog of the world's libraries to a bibliography, typing hardly a stroke. He even can order online from far-away libraries.

In 1945, a prominent scientist, Vennevar Bush, wrote a Jules Verne-like article in which he boldly predicted the future of data processing and associated technologies. Bush's library of the future resided in a desk drawer. Ultra high-resolution microfilm allowed the entire contents of the world's libraries to be condensed into this small space. Access was provided by devices remarkably like the personal computers of today. Bush called this entire system MEMEX, and librarians have long dreamed of providing users with such a system. Much of what Bush fantasized 40 years ago has become, or is becoming, a reality. We have the small computers, and even the storage devices to handle large masses of data. You and your PC can now access the world's libraries from your desk at home.

Problems and Projects

Unfortunately, the missing link is the ability to access the information by subject. Subject indexing is not much more advanced now than it was in 1945. If one author uses the term "small computer," another uses "microcomputer," and a third uses "personal computer," you can see how confusing subject retrieval can be. As collections grow, this problem grows worse.

While subject access remains the most difficult problem, there are many innovative projects in progress around the country. Northwestern University, Dartmouth College, the University of California, the University of Chicago and the Pike's Peak Public Library District are among the many libraries that have created online catalogs accessible from computer terminals. Harvard recently bought the Northwestern technology. A number of companies have set out to provide services to libraries trying to automate. They will provide hardware, software, consulting and retrospective conversion services. Even the smallest libraries now have the possibility of automating. Every day, new software is appearing that allows libraries to use microcomputers for library functions.

Do You Run Your Business OR DOES IT RUN YOU?

The biggest headache you may be facing these days is getting better control of your business. Tracking unpaid bills, sending out second billings, monitoring which salesman sold how much and to whom, keeping track of inventories, and on and on.

There's a remedy. It's called VersaForm... the business database.

VersaForm is a powerful database designed specifically for business, but based on the simplicity and convenience of your familiar business forms.

If you can fill out a business form, you can create a database.

VersaForm starts with your existing forms and procedures. As you copy your forms onto the screen, VersaForm automatically creates a database for you. It records and saves information from Purchase Orders, Invoices, Job Estimates, Disbursement Ledgers... maybe even a few things you're not recording that you should be.

VersaForm is an electronic file cabinet that will store all this information, yet have it at your fingertips when you need it! It's designed with a non-technical user in mind, so you can concentrate on streamlining your business with none of the usual database headaches.

Adapts to your business... your way.

With VersaForm you don't have to completely re-orient your staff. It fits right into the way you're doing business now. Only now your operations will be completed more efficiently and with electronic speed.

- A doctor in Moulton, Texas, posts his patient billing and completes his medical insurance forms with VersaForm.
- A small college in Wheaton, Maryland, uses VersaForm to create tuition invoices, class lists, accounts

receivable, and accounts payable.

- A computer supplies company in Mountain View, California, writes payables checks and does expense distribution with VersaForm.



- A roofing company in Green Bay, Wisconsin, computes job estimates, contracts, invoicing, and tracks actual costs with VersaForm.
- A manufacturer in Beaver Falls, Pennsylvania, uses VersaForm to build his company's parts records, and generates "where-used" lists.

VersaForm has the power to do these jobs and more because it's designed especially for business. It can also calculate taxes and prices, and can look up discounts, so you don't have to. VersaForm will even print on your own pre-printed forms.

Pull information together fast.

Pulling information together from paper files can be time-consuming and frustrating. Why make it tough? VersaForm puts vital reports like sales analyses, overdue payables, open purchase orders, and alphabetical employee lists at your fingertips. Minimum effort, maximum results.

All in one easy-to-use, integrated package.

VersaForm provides a screen formatter, a data entry program, a database, a report generator and a forms printer. And you can purchase pre-designed Templates for standard jobs like Purchasing, Invoicing, and Expense Journals. VersaForm is the all-in-one business productivity tool. Ask for a demonstration at your computer dealer. Or contact us directly.

VersaForm™



If you want to know more, send in this coupon. We've got a lot to tell you about.

Name _____		
Company _____		
Address _____		
City _____	State _____	Zip _____
Type of Business _____		
Mail to: Applied Software Technology 170 Knowles Drive Los Gatos, California 95030 (408) 370-2662		

123-G

For use with the Apple II, IIe and III, and the IBM PC and compatibles.

CIRCLE 136 ON READER SERVICE CARD

"The best accounting system for the IBM PC® that I've seen."

Boston Microcomputing Consultant

That's what we're hearing these days from industry experts and business users alike.

No wonder. Our ACCOUNTMASTER 8/16™ System has been perfected over the last seven years in a complete range of applications, and it's already running on 8,000 microcomputers from coast to coast.

The ACCOUNTMASTER 8/16 System has a combination of features you won't find in any other microcomputer accounting software.

It has the flexibility to adapt to your procedures, the capacity to accommodate a growing business, and the modularity to let you build the coordinated general accounting system you really need, function by function.

What's more, the ACCOUNTMASTER 8/16 System runs not just on the IBM PC but on any 8 or 16-bit microcomputer that uses CP/M™, CP/M-86™, MP/M™, MP/M-86™, or MS-DOS™. You're not limited to one brand of hardware.

If you'd like to read all about the best price/performance accounting software on the microcomputing market, just drop us a line or give us a call toll-free at 800-547-SBSG (except in Mass.)

The Can-Do People in Microcomputing

SMALL BUSINESS SYSTEMS GROUP

6 Carlisle Road • Westford, MA 01886 • 617-692-3800

User-proven microcomputer software and systems for accounting, communications, electronic mail and more

Trademarks: IBM PC, International Business Machines, ACCOUNTMASTER 8/16, SBSG, CP/M, CP/M-86, MP/M, MP/M-86, Digital Research, MS-DOS, Microsoft

The computers are used for routine functions, such as circulation, acquisitions, and serials control. In certain cases, computers are provided to patrons. Some libraries have coin-operated PCs, which are used just like the coin-operated copy machines. Other libraries are lending portable computers to patrons just as they do books.

Researchers are constantly looking for new ways to provide library services. One of the more interesting projects is a joint effort between the Library of Congress and RLIN to automate the entry of Korean, Japanese and Chinese materials. Yes, Charlie, we really do need Chinese.

The biggest problem in this scenario is money. Libraries and networks are strapped for cash and are finding the enormous sums needed for automation difficult to extract from government or private foundations. Increasingly, the user is asked to foot part of the bill. This is a serious threat to the long tradition of free library service, which has prevailed so long in this coun-

LIBRARIES
are finding the
enormous sums needed
for automation difficult
to extract from
government or private
foundations.

try. The problem prompted the governor of California to suggest a subsidy to library users to pay for these costly services. It is difficult to predict what the outcome will be, but many librarians are concerned, as are educators, that the new technologies will create a class structure of the information rich and the information poor. In all likelihood, the financial and social problems will prove more difficult to solve than the technological ones. /PC

Victor Rosenberg, Associate Professor of Library Science at The University of Michigan, is president of Personal Bibliographic Software, Inc. in Ann Arbor, Michigan.

NEW FOR YOUR IBM PC

NEW! IBM® BASIC from the Ground Up

(Simon) Use this easy-to-follow guide for step-by-step guidance in IBM BASIC. The author assumes no prior knowledge as he takes you from ground level of "What is programming?" up to more sophisticated techniques. Round out your working knowledge with four valuable appendices. They show you features of the IBM system and programming techniques beyond BASIC; how to use the IBM manual; how to modify programs with the BASIC program editor; how to use diskettes. #8350, \$15.95

NEW! Business Programs for the IBM® PC

(Hildebrand) Presents 62 time-saving business programs for your IBM PC. Programs include interest calculation, financial analysis, job cost, payroll, and depreciation. All are thoroughly documented for easy use. Also shows you how to set up your computer to take advantage of standard forms, create a menu to keep track of your programs, devise key-and-pass words to limit program access, and more. #8351, \$15.95.

NEW! Getting Started with CP/M®

(Patten and Colandrine) Introduces you to CP/M-80. Explains how it operates and describes the structure and function of its commands. Answers questions on handling diskettes, storing and transferring information, creating and naming files, reacting to error messages, and using specific command structures and options. With manufacturers now offering CP/M as a standard software component, this is a vital and timely guide. #5208, \$12.95.

The 8086/8088 Primer, Second Edition

(Morse) Written by the designer of the 8086 microprocessor. Thoroughly covers 8086/8088 micros — architecture, systems design, and programming. Architecture includes machine organization, register and memory structure, addressing modes, and the 8086/8088 instruction set. System design shows how to combine the 8088 chip with other components to form a complete system. Also explains bus structure, data amplifying, and more. #8255, \$14.95



CP/M® Revealed

(Dennan) Explore and master the full potential of CP/M — the most popular operating system for microcomputers. The author breaks down the technical aspects of CP/M into step-by-step explanations. He clearly describes the data structure of the CP/M disk. Booting up, logging in, changing memory size, mapping disk space, collating programs, and interfacing are explained to help you use CP/M more effectively. #5204, \$15.95

**Order By Phone
1-800-631-0856**

operator IBM3
In NJ Call (201) 643-0550, ext. 4001



NEW! IBM® User's Manual

(Heid) An all-inclusive guide to your IBM Personal Computer. Covers all aspects of operation — hardware materials, software capabilities, effective programming techniques, screen displays, graphics. Takes you through every phase in an easy-to-read step-by-step fashion — from unpacking the unit and installation to advanced programming and other operating systems. #6262, \$19.95.

IBM and CP/M are registered trademarks of International Business Machines Corp. and Digital Research Inc. respectively. Neither is affiliated with Hayden Book Company, Inc.



Mail to: Dept. IBM3 • Hayden Book Company, Inc.
10 Mulholland Drive • Hasbrouck Heights, NJ 07604

Please send me the book(s) indicated below by code number. If I am not completely satisfied, I may return the book(s) undamaged, within 10 days for a complete refund.

I am enclosing \$2.00 to cover postage and handling.

☐ Enclosed is my check or money order ☐ Bill me ☐ Visa ☐ MasterCard

Name

Address

City

State

Zip

Visa/MasterCard #

Exp.

Signature

Residents of NJ and CA must add sales tax. Prices subject to change. 8931

Hayden

BREAKTHROUGH SOFTWARE. at a breakthrough price.



Mailtrak
List Management System

This powerful package includes full name and address information plus 2 phone numbers, 5 mail profile codes (user defined), and 4 activity codes with dates! Phone directories, Labels up to 4 across (with optional message), Master list and files for Easy Writer, WordStar, or other word processors. Instantly locate a record by Name, Company, City, State, or Zip. Merge files or create sub-files. Up to 2,400 records per diskette depending on capacity.

\$65

Includes diskette.
Manual and shipping
\$15 for manual only
refundable on diskette purchase

TC Software

6107 West Mill Road, Flourtown, PA 19031 215-836-1406

CIRCLE 465 ON READER SERVICE CARD

Contemporary ComputerWear

DUST COVERS
FOR
THE IBM PC



Attire your IBM PC in style! ComputerWear is dust protection with class. Design features include select, woven fabric and embroidered emblem. Order now. Satisfaction guaranteed.

☐ YES, PROTECT MY PC IN STYLE! SEND ME: ☐ CHECK
☐ Keyboard(s) \$16 ☐ Monitor(s) \$18 ☐ VISA
☐ Drive(s) \$18 ☐ Printer(s) \$18 ☐ MC
☐ 1pc Mon/Drive\$36 Add \$2.00 Shipping Total: \$_____ (CA. Res. add tax)

Print Name: _____
 Address: _____
 City/State: _____ Zip: _____
 Credit Card # _____ Exp. _____
 Signature: _____

Contemporary ComputerWear Attn: EM
 1320 36th Ave./San Francisco, CA 94122 • 415/564-0506
 IBM PC is a trademark of International Business Machines Inc.

CIRCLE 196 ON READER SERVICE CARD

In Less Than 3 Minutes

Your IBM Model 50, 60, 65, 75 or 85
Electronic Typewriter
can be an RS232C PRINTER or TERMINAL



CALIFORNIA MICRO COMPUTER
Models 5060 and 5061 can be
installed easily and require NO
modifications to the typewriter.

\$399

For additional information contact:

CALIFORNIA MICRO COMPUTER
17791 Jamestown Lane, Huntington Beach, CA
92647 (714) 847-4141

Kill Surges Like Lightning!



Surge/Dropout and
U.S. Standard models.

Model SS-120-H
& LISTED

Now, with Surge Sentry™, you can protect your business computer, word processor and other sensitive electronic equipment from destructive power surges, drops, and electrical noise... starting at less than \$90!

Simply plug Surge Sentry in for fast, permanent protection. Surge Sentry will not degrade... no matter how many surges it kills. The indicator light tells you it's working perfectly, and we back every unit with a one year "no questions asked" warranty.

To learn more about surges and the entire Surge Sentry line, call or write:

IRKS INDUSTRIES

Telephone (408) 438-5760
 4865 Scotts Valley Drive, Scotts Valley, CA 95066
 CIRCLE 531 ON READER SERVICE CARD

PORTABLE 68000 ASSEMBLER

MOTOROLA SYNTAX MACROS
LINKER CONDITIONALS
OBJECT LIBRARIAN
CROSS REFERENCE
STRUCTURED PROGRAMMING FEATURES

OBJECT CODE OPTIMIZED \$300
FOR CPM-80, CP/M-86K
OR IBM-PC

PORTABLE C SOURCE \$750

Quelo
843 NW 54th
Seattle, WA 98107

(206) 784-8018
mornings
Dick Curtiss

CPM is a trademark of Digital Research.
IBM-PC is a trademark of IBM

CIRCLE 343 ON READER SERVICE CARD

ELIZA IS HERE!

AT LAST! A FULL IMPLEMENTATION of the original ELIZA program is now available to run on your IBM Personal Computer!

Created at MIT in 1966, ELIZA has become the world's most celebrated artificial intelligence demonstration program. ELIZA turns your computer into a non-directive psychotherapist with whom you can converse much as you would with a live therapist. She analyzes each statement as you type it in and then responds with her own comment or question. Response time is virtually instantaneous, and her remarks are often amazingly appropriate!

Designed to run on a large mainframe, ELIZA has never before been available to personal computer users except in greatly stripped down versions lacking the sophistication which made the original program so fascinating.

Now, our new IBM PC version possessing the FULL power and range of expression of the original is being offered at the introductory price of only \$25. And if you want to find out how she does it (or teach her to do more), you can buy the complete IBM Disk BASIC SOURCE PROGRAM for only \$20 additional.

Order your copy of ELIZA today and you'll never again wonder how to respond when you hear someone say, "Okay, let's see what this computer of yours can actually do!"

AVAILABLE ON DISK IN TWO VERSIONS FOR THE PC

1. Protected Version.....\$25
(Protected Version can be run but not listed or modified)
2. Un-protected IBM Disk BASIC Source Version.....\$45
(Source Version can be listed and modified as well as run)

Both versions include a six page user manual.

Please add \$2.00 shipping and handling to the above amounts
(California residents add 6% sales tax)

ARTIFICIAL INTELLIGENCE RESEARCH GROUP

921 North La Jolla Avenue, Dept. P
Los Angeles, CA 90046
(213) 656-7368 (213) 654-2214

MC, VISA and checks accepted

CIRCLE 128 ON READER SERVICE CARD



IBM PC ENGINEERING SOFTWARE

Over 25 Powerful
Programs
Includes

- STRUCTURAL ENGINEERING
- HVAC LOAD PROGRAMS
- ELECTRICAL ENGINEERING
- SOLAR ENERGY
- ENERGY MANAGEMENT
- Much More...

Dealer Inquiries Welcome
Call or Write for Information

**MC↑2
PROGRAMS**

McClintock Corp.
9655 S. Dixie Hwy P.O. Box 430980
Miami, FL 33243 (305) 666-1500 Telex 441582

PC 4-83

CIRCLE 398 ON READER SERVICE CARD

8" DISKETTES ALSO AVAILABLE

TOP QUALITY 5 1/4 DISKETTES

SPECIFY SOFT, 10 or 16 SECTORS

	\$/10	\$/50	\$/100
● wabash			
SSDD (M13A411X)	23.00	112.00	218.00
DSDD (M14A411X)	30.00	146.00	286.00
● control data			
SSDD (CDC1242-00)	22.00	106.00	210.00
DSDD (CDC1244-00)	30.50	147.00	290.00
● 3M scotch			
SSDD (3M 744D-0)	22.00	109.00	213.00
DSDD (3M 745-0)	31.00	150.00	295.00
● verbatim			
SSDD (MD525-01-18158)	25.20	124.00	245.00
DSDD (MD550-01-18188)	36.50	180.00	355.00
● maxell			
SSDD (MAX-MD-1M)	28.95	140.00	270.00
DSDD (MAX-MDZ-DM)	39.00	192.00	380.00
● dysan			
SSDD (DYS 104-1D)	36.00	177.00	350.00
DSDD (DYS 104-2D)	41.00	202.00	400.00

CALL TOLL FREE 800-824-7888

(VISA, M.C., COD. ORDERS ONLY) OPERATOR 806
7 DAYS A WEEK

creativity **Unlimited**

- CHECKS M.O. VISA
- M.C. - ADD \$2.00 SHIP
- CA. RESIDENTS ADD
- 8% SALES TAX
- SURCHARGE ON ORDERS
- SHIPPED OUTSIDE USA

P.O. BOX 3304
SARASOTA, FL 34201
(408) 252 4210

**FREE
CATALOG**

Dealer Inquiries Invited

CIRCLE 205 ON READER SERVICE CARD

Reliable 3M Diskettes \$2.11 ea.

*SINGLE SIDED PRICE OFFER IN EVEN CASE
QUANTITIES OF 50 (\$2 x 2.11)
TOTALS \$105.50 PLUS SHIPPING

DOUBLE SIDED \$2.30 ea. FOR 3M DOUBLE
SIDED, DOUBLE DENSITY, RM
IN EVEN QUANTITIES OF 50
\$145 PLUS SHIPPING COST

COMPUTERS

Compaq	
Dual floppy Desk Top System	\$4999.00
Singla floppy - 10 Meg System	3799.00
Dual floppy Portable System	2549.00
COLUMBIA	
Dual floppy Desk Top System	2549.00
Dual floppy Portable System	2750.00

HARD DISK SYSTEMS

CONVUS	
4 Megabyte	\$1799.00
11 Megabyte	2299.00
39 Megabyte	3249.00
Online Rep & Service available	
DAVING Hard Disk	1799.00

PRINTERS & PLOTTERS

C-110A Printer 10" (Parallel)	\$399.00
EPSON RX 80	329.00
TRANSTAR 315 Color (Parallel)	449.00
COMPAQ CR-2	449.00
HEC 3000 Separator	1749.00
HP 7470 (Serial)	995.00

MODEM & BUFFERS

CONVULS Microprocessor 18K (P-P)	\$159.00
NAYTES Smartmodem 300/1200 baud	489.00

MANUALS, BOOKS & TRAINING

ATI TRAINING POWER (Dissemin & Guide)	
Lotus 1-2-3	55.00
MS-DOS v. 1.1 & 2	55.00
WordStar v. 1 & 2	55.00
Superdiner	55.00
Multi-Plan	55.00
SuperCalc	55.00
Visual	55.00
MS DOS	55.00
FLIPTRAC (Audio Tapes)	
How to Use Visicalc	59.50
How to Use Wordstar	44.95
How to Upgrade the IBM PC	44.95
TECHNICAL (Audio Tapes & Transp)	

DOS 2.0	25.95
LOTUS 1-2-3	25.95
WordStar	25.95
MIS (Books & v. w/o diskettes)	
Power of VISICALC	13.95
Power of WORDSTAR	13.95
Power of SUPERCALC	13.95
Power of MULTIPLAN	13.95
Power of LOTUS 1-2-3	13.95
Financial Calculators for 1-2-3	13.95

ACCESSORIES

Play Sort (Heat 70 Diskettes)	\$24.95
FUTRA Acrylic Printer Stand 10	24.50
FUTRA Acrylic Printer Stand 13	34.50
KALKA P100	55.00
Micro General "PC Weightmaster"	629.00

SOFTWARE UTILITIES

The Norton Utilities	\$69.00
SAFECOPI (copy program)	45.00
OS/2 MICROASIC (copy program)	63.00

RESERVE POWER & SURGE SYSTEMS

RA ELECTRONICS	
Guardian Angle PC & PC XT 150W	\$249.00
EDP Electronic Protection Device	
The Grizzly 200W	849.00
The Grizzly 500W	2299.00
"Lament" Suppressor	49.95
"Orange" Suppressor	119.95
"Lime" Suppressor	69.95
Recharge Suppressor	89.95
COMPUTER ACCESSORY	
P-12 (4) Channel Power Director	\$149.00
P-21 (4) Channel Power Director	89.00
P-22 (4) Channel Power Director	79.00
KINGSTON MICROPHONE "PC Save"	39.00

DATA BACKUP & SECURITY SYSTEMS

ALDO "PC Backup"	\$1799.00
ALDO "PC Tape Backup"	1579.00
DAVING "XT Tape Backup"	1729.00



TERMS:
Shipping add 3% for product shipped within continental USA via UPS surface (Minimum \$4.00) If the order placed to prepaid with U.S. funds to the tune of a check or money order, a Total Charge of \$4.00 is all you pay for shipping within the continental USA via UPS surface. (Minimum specified above). Allow 14 working days for personal and company checks to clear. Credit card charges limited to \$1000. No COD's. P.O., A/P or orders outside continental USA call or write for shipping charges or add 20% to purchase price (any difference will be refunded). CA residents add 6% sales tax (LA County 6.5%). All offers subject to change or withdrawal without notice.

MICROCOMPUTER MAILORDER SINCE 1979
FUTRA COMPANY
Warehouse/Office
20905 S. Western Ave.
Suite # 124
Torrance, CA 90501
Order Placement
By Telephone
(213) 228-1128
(213) 228-1054
By Mail
Form 35
Credit PC-1182
P.O. Box 4280
Torrance, CA 90510

CIRCLE 607 ON READER SERVICE CARD

PC UTILITIES

SOURCE CODE INCLUDED

COMPATIBLE WITH DOS 1.1 AND DOS 2.0

PrintRelief \$20
print spooler — parse, disconnect, page restart

SnapShot \$20
print screen — shaded graphics
— prints complete character set

DiskFix \$20
disk utility — reveals hidden files / hides regular files
— removes erased files
— volume label modification (DOS 2.0 only)

KattPak \$50
INCLUDES THE 3 UTILITIES ABOVE PLUS A MORE FOR

FREE

AVAILABLE ONLY WITH THE KattPak

KattCalc — 4 multifunction calculators in one
SWH — monochrome/color monitor switch

KattScreen — sets foreground, background, & border colors
ALSO INCLUDES ATTRACTIVE BINDER FOR PLACING YOUR KattPak



MAIL: PHONE ORDERS (615) 617-8991
NO SHIPPING OR HANDLING CHARGES
TN RESIDENTS ADD 6% SALES TAX

VISA, MASTERCARD, CHECK OR MONEY ORDERS ACCEPTED
261110-1000-1000-1000

katt associates
computer software specialists
2600 delrose dr., knoxville, tn 37914

CIRCLE 606 ON READER SERVICE CARD

Low Discount Prices & Technical Support — FANTASTIC VALUE

Computers:
Columbia MPC Computer in-
cludes 2 disk drives, 128K,
\$3,000 worth of software,
Columbia keyboard.
ALL FOR \$2735.00

Columbia Portable Computer in-
cludes 256K, 2 slimline drives,
9 inch monitor, \$3000 worth of
software.
ALL FOR \$2399.00

Software Publishing:
PFS File \$88.00
PFS Graph \$88.00
PFS Report \$88.00

Printers:
Epson FX-80 \$525.00
Epson FX-100 \$689.00
Epson RX-80 \$349.95
Epson RX-80 FT \$469.95

Gemini 10X \$295.00
Gemini 15X CALL

Prowriter I \$365.00
Prowriter II \$625.00

Diskettes:
Elephant DD/DD \$28.99
Maxell MD-2 \$39.95

Software:
Lotus 1-2-3 \$319.95
DBase II \$395.00
Microsoft Multiplan \$269.00
Kraft Joystick at dealer
cost \$39.95

FREE CATALOG

TEAM COMPUTER PRODUCTS
109 Church Street, Suite 303
New Haven, CT 06510
(203) 777-2284

FREE CATALOG

CIRCLE 508 ON READER SERVICE CARD

GLOBAL THERMONUCLEAR WAR!™



THE GAME

Match your wits against the computer and prevent World War III. If you fail, be prepared to fight with a complete arsenal of state-of-the-art tactical and strategic weapons. Features include:

- Full color graphics and exciting animation
- HAL™ speech synthesis (without special hardware)
- Realistic sound and special effects
- Options to play as enemy or defender
- Top 10 score display

Available for IBM-PC, APPLE II, and COMMODORE 64 computers.
IBM-PC version requires 64K, one disk drive, and color graphics adapter. APPLE versions require 48K, and one disk drive, and DOS 3.3. COMMODORE 64 version requires cassette.

IBM-PC is a registered trademark of IBM Corp.
Apple II is a registered trademark of Apple Computers.
Commadore 64 is a registered trademark of Digital Research.

STARFIRE GAMES, Division Omnisoft Corporation
9960 Owensmouth Ave., Dept L33, Suite 32
Chatsworth, CA 91311

Please rush me GLOBAL THERMONUCLEAR WAR™ for the
☐ IBM ☐ APPLE ☐ money order for \$34.95
Enclosed is a ☐ check ☐ COMMODORE 64
(California residents please add 6 1/2 % sales tax)

CIRCLE 376 ON READER SERVICE CARD

Name _____ Address _____ City _____ State _____ Zip _____

Raytronics introduces the 256K RAM CHIP on the million-byte board!

Exclusive Megabyte Memory!

Raytronics puts an end to all of the "someday" talk about megabyte memories in personal computers. Here's the industry's first 256 RAM chip—now available on RAMPLUS! Only Raytronics' multifunction RAMPLUS gives your IBM PC, IBM-XT, or IBM-compatible so much flexibility, so much versatility. Now all of your programs interact in your PC at one time.

Exclusive Memory Mapping!

Only RAMPLUS' PROM-controlled Memory Mapping accommodates either 64K chips, or 256K chips, or a combination of both for your special applications and memory management.

IBM is the registered trademark of International Business Machines. RAMPLUS is a trademark of Raytronics.



The RAMPLUS!

Exclusive DRIVEPLUS!

Raytronics' exclusive drive emulation program DRIVEPLUS supports megabyte memories. Compatible with both older and new-model IBM PCs, IBM-XT, Corona, Compaq, and other PCs, DRIVEPLUS is furnished free with RAMPLUS. (It's also available separately; contact your dealer.)

Other RAMPLUS features

include an RS-232-compatible serial port... a parallel printer port... a clock/calendar with backup battery... and more. Ask for Technical Note No. 2671-1.

Call Toll-Free! Outside California, dial (800) 854-1085 for the name of your local dealer. In California, call (619) 270-4000.

Special Rebate Offer:

RAMPLUS is the only memory board that lets you purchase 64K chips now and then receive a rebate when you're ready to trade up to our new 256K chips. Buy 64K today—move up to one megabyte as you need it.

See your dealer for details or contact:



RAYTRONICS

4901 Morena Blvd., Bldg. 900, San Diego, CA 92117

CIRCLE 741 ON READER SERVICE CARD

If you have avoided buying educational software for fear of owning a "lemon," don't despair. The following article will help you select the best programs from the available crop.

Evaluating Educational Software

Using a computer to assist in the learning process is a logical and appealing concept. Although Computer-Assisted Instruction (CAI) is not new, the growing availability of microcomputers has created an increased demand for educational software, or "courseware." This demand is being met by a rapidly growing industry with the sole purpose of providing educational software for microcomputers.

As with all new endeavors, microcomputer courseware development is experiencing growing pains. While standards for quality courseware are becoming more refined, the body of existing courseware consists of badly designed programs that are little more than drill-and-practice routines. As educational tools, these have proved disappointing, partly because they force the learner to follow a fixed path. Studies conducted by Dr. H. J. Becker, of the National Institute of Education, show that 35 percent of teachers who initially purchase drill-and-practice software use

it significantly less than they had anticipated.

Good courseware is available, however. A fundamental rule of all good courseware is that it is highly interactive, enabling the learner to change the flow of the lesson to meet his or her individual needs. (Poorly designed courseware often is reactive, meaning that the learner simply responds to a prompt provided by the computer.) Quality courseware takes advantage of its computerized medium and is designed from the ground up. Content first is given careful consideration. Scientifically derived instructional design techniques are then utilized to place control of the lesson largely in the hands of the learner.

Perceiving Levels

When evaluating courseware, the first step is to determine how the lesson is designed. Certain learning activities demand much more flexibility from a lesson

design than others. For example, a lesson designed to teach spelling does not need to be as flexible as one designed to teach analogies, or one that compares two dissimilar concepts, such as the sonnet and the limerick forms of poetry.

In essence, there are three levels of lesson design: (1) instructional games; (2) schoolwork-related courseware; (3) courseware that teaches analytical or practical skills. These categories are not rigid and sometimes may overlap.

For children who have never used a computer before, games serve as a good introduction to the PC and provide an easy transition to the concept of using the computer for learning. Level-one instructional games allow children to become comfortable with the computer and teach them to respect its capabilities. The lessons utilize many features found in video games, and yet they are learning-oriented. *Farvengerz*, by Spinnaker Software, is a good example of this type of program.

Once a child has realized that learning with the computer can be fun, second-level courseware can help with schoolwork. If you are a parent evaluating second-level courseware, your primary concern should be the program's relevance to your child's schoolwork. This requires some effort on your part to make a good match between your child's curriculum in school and the courseware you buy.

Lesson Design

Once you have decided that a level-two lesson is appropriate, take a closer look at its design. Is it a drill-and-practice lesson, or a more sophisticated tutoring package that encourages a higher degree of interaction? Foct-Truck, by SRA, is a good example of a drill-and-practice lesson. The learner selects the level of difficulty and then performs a timed exercise testing basic math skills. When the exercise is over, the child is told how many problems were answered correctly and is shown problems that were missed. SpeedReader, by Davidson and Associates, is a more sophisticated level-two lesson designed to systematically present instruction on how to increase reading speed and comprehension.

While third-level courseware is designed to teach analytical skills, such as problem-solving techniques or even computer programming, it also can help sharpen practical skills. For example, teaching a child to write with a word-processor can alleviate such traditional frustrations as poor penmanship and poor spelling, and the interactive editing capability of a word-processor can enhance both writing and typing skills. In this example, the users also learn to apply the computer in

their daily lives. Many educators feel this is the true definition of computer literacy.

Problem-solving techniques taught with third-level courseware do not always involve right and wrong answers. A child often learns that finding the solution to a problem involves the concept of "debugging," a valuable analytical skill that can be applied to almost any activity where a creative solution is required.

Evaluation Guidelines

Five tests can be applied to a courseware program to help you evaluate its quality. (A basic evaluation scheme for courseware was discussed in two previous articles. See "Educational Software for the PC," PC, Volume 1 Number 8; and "The Blossoming of Computer Aided Instruction," PC, Volume 1 Number 12.) The five tests are:

- Effectiveness: How well does it teach?
- Efficiency: How easy is it to use?
- Documentation: How good are the instructions?
- Appeal: Is it fun to use?
- Use of the computer: Does it maximize the unique capabilities of the computer?

These five criteria should be used during all phases of your evaluation process, whether you are looking at a demonstration program, studying product documentation, or simply reading an advertisement. See Figure 1 for an evaluation format and checklist.

Effectiveness and Efficiency

Effective courseware not only teaches the correct way of doing things, but also

provides feedback to the user in practice sessions. This feedback should reinforce correct answers to questions and describe the correct solutions to problems answered incorrectly. An option for extend-

I
*TS EASY
to judge a lesson's
efficiency if you can get
a hands-on demo.*

ed review should also be available.

Effective second- or third-level courseware should begin with a presentation of the core idea or problem. This should be clearly explained and applications or solutions illustrated with examples. The user then proceeds to practice exercises.

Ideally, the learner should be able to move at will through the various portions of a lesson. If the learner feels comfortable with the material and wants to go immediately into a practice situation, he or she should not have to sit through the presentation of the core idea or the examples. Also, access to a help function should be available at any point in the lesson.

Lesson design plays a major role in determining lesson effectiveness. As a general rule, the more flexibility allowed to a learner, the more effective the lesson will be. However, a well designed lesson must have content of equal quality if the courseware is to be truly effective.

It's easy to judge a lesson's efficiency if you can get a hands-on demo. These are

Figure 1: The courseware evaluation checklist.

INSTRUCTIONAL EFFECTIVENESS

- Core ideas are clearly defined: _____
- Learner can choose his own path through the lesson: _____
- Knowledge of results is provided during practice: _____
- Positive feedback to correct responses: _____
- Help is available on demand: _____

EFFICIENCY

- No lesson programming errors: _____
- Lesson flows smoothly and is easy to use: _____
- Lesson is well planned and organized: _____

DOCUMENTATION

- Learning objectives are clearly stated: _____
- Intended age level is described: _____

- Minimum computer requirements are listed: _____
- Complete first-time user instructions are included: _____
- User telephone hotline available: _____

APPEAL

- Lesson concept is appealing: _____
- Multiple use without boredom or repetition: _____
- Packaging is well-designed and attractive: _____

USE OF THE COMPUTER

- Use of color: _____
- Use of sound: _____
- Use of function keys: _____
- Program executes quickly: _____
- Good programming techniques: _____

some of the factors you should consider: Does the lesson run without programming errors? Does the program require many prerequisite skills? Can the learner move easily from display to display, unit to unit, or lesson to lesson? Does the lesson flow smoothly? Can users skip over portions that are irrelevant to them, or must they sit through the entire lesson to get to the parts that interest them?

Documentation and Appeal

If you can't get a hands-on demonstration, the lesson's instruction manual should give many answers to these questions. The documentation should tell you everything you need to know about the lesson, including the learning objectives, the intended grade level, and whether or not the program is flexible. It also should discuss the lesson design: Is it drill and

GOOD courseware takes advantage of the features of the PC.

practice, or is it more sophisticated design? The minimum PC configuration required to run the program should be explicitly stated. Step-by-step instructions detailing how to use the lesson for the first time are extremely important.

The documentation by itself should help you decide whether or not to buy the courseware. If the documentation is well-written, clear, and easy to use, chances are that the courseware will be equally good.

The appeal of courseware must be judged by your personal standards. Some of the questions you might ask include: Is the concept of the courseware attractive? Is it something that will hold a child's attention? Is the program well designed and appealing enough to be used more than once? Some courseware allows a learner to take a unique path each time through the lesson, which means a child can learn math, or science, or spelling without boring repetition. This is one of the major advantages courseware has over more traditional, less interactive media, such as books and films.

Numbers got you down?



Get out from under the avalanche of abstract numerical data with the powerful new graphics package designed for the IBM PC by Mirror Images.

Mirrorgraph transforms unwieldy figures into clear, visual representations. **Bar graphs, pie charts, and line graphs** make evaluation of your figures far more revealing than columns of numbers ever could.

Sophisticated enough for comprehensive analysis, **Mirrorgraph** is so simple to use you'll be able to quickly produce professional charts with ease, either on the screen or in hard copy form.

And the best number of all is its low price of **\$59.95.**

So get out from under those numbers. And let **Mirrorgraph** take over instead.

Contact your local dealer or send check or money order to Mirror Images Software Business Division, 1223 Peoples Avenue, Troy, NY 12180. Please include \$1.50 for postage and handling. NY residents add 7% sales tax. Credit card orders are also welcome.

Requires 64K, DOS 1.1, double-sided drive, color graphics adapter.

IBM is a trademark of International Business Machines Corp. Mirrorgraph is a registered trademark of Mirror Images Software, Inc.

See us at PC 93, Booth no. B121

Dealer inquiries welcome.

**MIRROR
IMAGES®**

(518) 274-2335

CIRCLE 364 ON READER SERVICE CARD
PC MAGAZINE 527 NOVEMBER 1983

YOU DESERVE EXECUTIVE ACCOMMODATIONS. YOUR PERSONAL COMPUTER DOES, TOO.



LIFELINE puts your personal computer in the executive suite — the same tasteful surrounding you demand for yourself.

Designed for the IBM PC, XT, IBM Expansion Chassis and the Dec Rainbow, the LIFELINE Tower will unclutter your working area by housing your system unit *beside* your desk — not on top of it.

The LIFELINE Tower is available in solid walnut, solid oak, or a textured finish that matches your PC. Other types of hard woods, finishes and side panels are available from our special order shop.

To accompany the LIFELINE Tower, matching monitor and printer stands have been designed. The printer stand fits over the LIFELINE Tower, or can be placed on your desk. The monitor stand tilts and swivels to whatever position you desire. Monitor and keyboard extension cables are also available.

The LIFELINE Tower . . . a personal computer's executive suite.

Ask for the LIFELINE Tower at participating dealers, or order directly from Lifeline Information Systems, Inc. P.O. Box 766 Sandy, Utah 84091 801 566-5340.



color resolution. You'll notice a difference.

The HX-12 gives you more resolution and finer dot pitch (.31mm) than the IBM 5153's medium resolution (.43mm) for a cleaner, sharper image.

Compare our full range of colors and our crisp whites without red bleed. You'll also see a difference in

contrast. The HX-12's contrast is 100% brighter than the IBM 5153's. It's a difference that's noticeable for some people and overlooked by others.

Apple IIe users: call us to learn how you, too, can now enjoy the visible superiority of the Princeton HX-12.

At Princeton, we're serious about color. We're serious about the HX-12. It's right at the heart of our business.



Princeton
Graphic
Systems

1101-I State Road Princeton New Jersey 08540
609 683-1660 TLX 6857009 PGS Prin.
900-221-1490

DON'T COMPROMISE:



OURS: 31 mm dot pitch, 80 column text



THEIRS: 43 mm dot pitch, 80 column text.

THE PRINCETON HX-12 HIGH RESOLUTION RGB COLOR MONITOR

for the image
your eyes deserve

CIRCLE 299 ON READER SERVICE CARD



dBASE II™ made easy!

QUICKCODE™

The dBASE II Program Generator

Now dBASE II is made easy with Quickcode by Fox & Geller. QUICKCODE is a program generator, a computer program which writes computer programs.

FAST AND SIMPLE

With QUICKCODE you can generate a customer database in 5 minutes. Its that fast. All you have to do is draw your data entry form on the screen. It's that simple!

NO PROGRAMMING REQUIRED

QUICKCODE writes concise programs to set up and maintain any type of database. And the wide range of programs cover everything from printing mailing labels and form letters, to programs that let you select records based on your own requirements. There are even four new data types that are not available with dBASE II alone.

YOU CONTROL

And since you work directly with your information at your own speed and your own style, you maintain complete control. Telling your computer what to do has never been so easy.

Call us at (201)794-8883

QUICKCODE, by Fox & Geller. Absolutely the most powerful program generator you've ever seen. Definitely the easiest to use.

Ask your dealer for more information on QUICKCODE and all the other exciting new products from Fox & Geller.



FOX & GELLER

Fox & Geller, Inc. Dept. PCM 002 604 Market Street Elmwood Park, N.J. 07407 (201) 794-8883

The packaging of the lesson ought to be appealing as well, since it often reflects how much time and concern went into the overall design of the product.

Good courseware takes advantage of the function keys, color, graphics, sound, and other features of the PC. The documentation should indicate whether these features are used. If you get a hands-on demo, play with the keys to see if they take

EXPLORING hands on the keys should not cause a program to fail.

advantage of the PC, or if they cause potential problems. What happens if you hit a key at random or deliberately hit an incorrect key? The program should be able to handle errors like this. Children are curious: exploring hands on the keys should not cause a program to fail. Otherwise, the child may give up on the program in frustration.

Watch out for lengthy pauses when something is loaded into memory from disk. Are transitions logical and smooth? Use your intuition here: If a lesson makes no sense to you, imagine how it will appear to a child trying to use the program!

Some excellent programs can handle two or more learners at once, or allow a learner to leave the lesson and then pick it up again at the same point. These features help assure that the lesson will be used more than once.

A Promising Trend

Courseware development is a young industry. Given the short span of its existence, it is remarkable how much is available for microcomputers. Although the quality of courseware packages varies, there is a trend toward better, more consistent lessons. In the future, courseware will become an integral component of all personal computer systems. /PC

Dr. Richard A. Walker is president of Interactive Technologies Corporation, a San Diego firm that develops microcomputer and laser videodisk courseware. Chris Sherman is an instructional designer at the same firm.

Educational Software

A list of some of the educational software titles currently on the market, including product information and descriptions.

Alphabet Zoo

Spinnaker Software
215 First St.
Cambridge, MA 02142
(617) 868-4700

Price: \$29.95

Requires: 64K RAM, one disk drive, color graphics adapter.

Age Group: 3 to 8 years

Description: Two games that teach the relationship between sounds and letters, and sharpen skills.

CIRCLE 687 ON READER SERVICE CARD

Computer Discovery

Science Research Associates, Inc.
155 N. Wacker Dr.
Chicago, IL 60606
(312) 984-7000

Price: \$200 program, \$49.95 workbooks, \$7.50 teacher's manual

Requires: 64K RAM, one disk drive, color graphics adapter

Age Group: Grade 7, and up

Description: Introduction to the computer, both operation and programming, and social issues.

CIRCLE 692 ON READER SERVICE CARD

Creature Creator

DesignWare
185 Berry St.
San Francisco, CA 94107
(800) 572-7767, (415) 546-1866

Price: \$39.95

Requires: 64K RAM, one disk drive, color graphics adapter.

Age Group: 4 to 8

Description: Teaches the fundamentals of computer use by allowing children to create creatures and animate them to make them dance.

CIRCLE 693 ON READER SERVICE CARD

Cross Clues

Science Research Associates, Inc.
155 N. Wacker Dr.
Chicago, IL 60606
(312) 984-7000

Price: \$35.00

Requires: 64K RAM, one disk drive.

Age Group: Grade 7, and up

Description: A word game that calls on vocabulary, spelling, and word structure skills. For two players.

CIRCLE 688 ON READER SERVICE CARD

CryptoCube

DesignWare
185 Berry St.
San Francisco, CA 94107
(800) 572-7767, (415) 546-1866

Price: \$39.95

Requires: 64K RAM, one disk drive, color graphics adapter.

Age Group: 8 to adult

Description: Word-puzzle game, allows you to create your own puzzles.

CIRCLE 664 ON READER SERVICE CARD

Delto Drawing

Spinnaker Software
215 First St.
Cambridge, MA 02142
(617) 868-4700

Price: \$49.95

Requires: 64K RAM, one disk drive, color graphics adapter.

Age Group: 4 to adult

Description: Children can create graphics on the screen using single key commands to control the cursor.

CIRCLE 681 ON READER SERVICE CARD

FaceMaker

Spinneker Software
215 First St.
Cambridge, MA 02142
(617) 868-4700

Price: \$34.95

Requires: 64K RAM, one disk drive, color graphics adapter.

Age Group: 4 to 12 years

Description: The child creates a face and then animates the parts. Then the computer animates the parts and the child must match the movements.

CIRCLE 684 ON READER SERVICE CARD

Fact Track

Science Research Associates, Inc.
155 N. Wacker Dr.
Chicago, IL 60606
(312) 984-7000

Price: \$100

Requires: 64K RAM, one disk drive, color graphics adapter.

Age Group: Grades 1 to 6

Description: Timed drill and practice on mathematics facts.

CIRCLE 691 ON READER SERVICE CARD

Free Enterprise

Science Research Associates, Inc.
155 N. Wacker Dr.
Chicago, IL 60606
(312) 984-7000

Price: \$100

Requires: 64K RAM, one disk drive, color graphics adapter, printer strongly recommended

Age Group: Grade 9, and up

Description: Players in this decision-making simulation delve into strategies for winning at business.

CIRCLE 689 ON READER SERVICE CARD

Green Screen Stories

D.M. Studio
3400 Medline Lane
Bowie, MD 20715

Price: \$20

Requires: 64K RAM, one disk drive, BASICA

Age Group: 8 to 12

Description: Reading lessons from classical mythology and original tales.

CIRCLE 689 ON READER SERVICE CARD

Hey Diddle Diddle

Spinneker Software
215 First St.
Cambridge, MA 02142
(617) 868-4700

Price: \$29.95

Requires: 64K RAM, one disk drive, color graphics adapter

Age Group: 3 to 10 years

Description: Three-part learning game that introduces a child to traditional Mother Goose lore.

CIRCLE 685 ON READER SERVICE CARD

In Search of the Most Amazing Thing

Spinneker Software
215 First Street
Cambridge, MA 02142
(617) 868-4700

Price: \$39.95

Requires: 64K RAM, one disk drive, color graphics adapter

Age Group: 10 to adult

Description: The child solves an adventure, changing clues for the next game.

CIRCLE 686 ON READER SERVICE CARD

Karel the Robot: A Gentle Introduction to the Art of Programming

Cybertronics International, Inc.
195 Mount Kemble Ave.
Morristown, NJ 07960
(212) 532-3089

Price: \$242 for package, \$7 for textbook, \$85 for Karel Simulator, \$150 for course disks

Requires: 64K RAM, with Pascal

Age Group: 5th grade, and up

Description: Students create programs that allow Karel to travel through his world.

CIRCLE 686 ON READER SERVICE CARD

Kindercomp

Spinneker Software
215 First St.
Cambridge, MA 02142
(617) 868-4700

Price: \$29.95

Requires: 64K RAM, one disk drive, color graphics adapter

Age Group: 3 to 6 years

Description: Learning games prepare a child to read, spell, and count.

CIRCLE 686 ON READER SERVICE CARD

MasterType

Lightning Software
P.O. Box 11725
Palo Alto, CA 94308
(415) 327-3280

Price: \$49.95

Requires: 64K RAM, one disk drive

Age Group: 10, end up

Description: Instructional game that teaches typing skills.

CIRCLE 682 ON READER SERVICE CARD

Math Drills—I

Starware
1701 K Street NW
Suite 801
Washington, DC 20006
(202) 331-8833

Price: \$25

Requires: 64K RAM, one disk drive, color graphics adapter

Age Group: 6 to 16

Description: Drill and practice routines with arithmetic.

CIRCLE 673 ON READER SERVICE CARD

Mothletics

ABS Software
P.O. Box 309
Blue Bell, PA 19422
(215) 277-0304

Price: \$20

Requires: 64K RAM, one disk drive

Age Group: 5 to 17

Description: Drill and practice in basic math operations. Child determines level of drill difficulty.

CIRCLE 667 ON READER SERVICE CARD

Micro Discovery

Science Research Associates, Inc.
155 N. Wacker Dr.
Chicago, IL 60606
(312) 984-7000

Price: \$200 program, \$49.95 workbooks, \$10 teacher's manual

Requires: 64K RAM, one disk drive, color graphics adapter

Age Group: Grades 4 to 8

Description: Introduction to the computer, both operation and programming, and social issues.

CIRCLE 693 ON READER SERVICE CARD

No IBM PC should be without – PC CALCULATOR™

Software by **CTEK®**

for the IBM PC



- Financial Projections & Estimating
- Scientific & Engineering Calculations
- Adding Machine Applications
- Check Book Balancing
- Numerical Scratch Pad

PC-CALCULATOR

- 16 digit accuracy • Automatic rounding
- Selected number of decimal places displayed
- All registers continuously visible
- Visible F key definitions • Automatic stacking
- Operator error recovery • Item count register
- Three print modes, including instantaneous step-by-step record
- Diskette storage for results & data
- Full complement of functions including trig, log, & power

PROGRAMMABLE PC-CALCULATOR

- All PC-Calculator features plus
- Simple but powerful programmability
- Access over 250 programs
- Program Index & Display
- Up to 102 steps per program
- Convenient editing of individual program steps
- All program steps visible during entering & editing
- Selectable single step execution
- Visible program routing indicator during execution
- Programmable comments & screen messages

OPTIONAL FINANCIAL MODULE

Compound interest, Calendar, Discounted cash flow, IRR, Bonds, and Depreciation

SYSTEM REQUIREMENTS

PC-CALCULATOR and PROGRAMMABLE PC-CALCULATOR require an IBM PC with disk memory, one diskette drive, and an eight-column display. An eight-column printer is optional.

CTEK CORPORATION

748 E. Colorado St., Pasadena, CA 91101
213/795-7877

Name _____
Street _____
City _____ State _____
Zip _____ Phone _____
☐ CHECK ☐ MONEY ORDER ☐ COD ☐ VISA ☐ MASTERCARD
Card No. _____ Exp. Date _____
Signature _____

Specify ☐ PC 64K ☐ PC 128K or ☐ XT

QUANTITY DESCRIPTION COST

____ PC-Calculator Program Diskette & 32 pg. Owner's Guide @ \$39.95 \$ _____

____ Programmable PC-Calculator, Program Diskette & 64 pg. Owner's Guide @ \$69.95 \$ _____

____ PC-Calculator, Financial Module Diskette & 96 pg. Owner's Guide @ \$69.95 \$ _____

Shipping via UPS @ \$1.50 for up to 2 units plus \$.50 per unit over 2

California residents add 6 1/2% sales tax

TOTAL \$

\$150

Allow 2 weeks for personal checks

CIRCLE 164 ON READER SERVICE CARD

Mr. Moth Arithmetic Tutor
Term Computer Services
P.O. Box 725
New Providence, NJ 07974
(201) 665-0293

Price: \$29.95

Requires: 64K RAM, one disk drive

Description: Program generates problems in all four types of arithmetic at ten levels of difficulty.

CIRCLE 672 ON READER SERVICE CARD

Mr. Moth Money Tutor
Term Computer Services
P.O. Box 725
New Providence, NJ 07974
(201) 665-0293

Price: \$29.95

Requires: 64K RAM, one disk drive

Age Group: 2nd to 4th grade

Description: Four games, at different levels of difficulty, provide practice in coin counting, making change, and making purchasing decisions.

CIRCLE 671 ON READER SERVICE CARD

My Letters, Numbers, and Words
STONE Software Marketing
7910 Ivanhoe Ave. Suite 319
La Jolla, CA 92037
(619) 459-9173

Price: \$39.95

Requires: 64K RAM, one disk drive, color graphics adapter, BASICA

Age Group: 1 to 5 years

Description: The alphabet, numbers, and the concept of words are taught through animated flash-card routines.

CIRCLE 660 ON READER SERVICE CARD

Question

Alpha Software Corp.
12 New England Executive Park
Burlington, MA 01803
(617) 229-2924

Price: \$45

Requires: 64K RAM, one disk drive, color graphics adapter

Age Group: 8 to 18

Description: The learner thinks of an item from listed topics, and the computer tries to guess the answer by asking questions.

CIRCLE 675 ON READER SERVICE CARD

Reading Skills/Elementary
Pace Educational Software
7121 Quincey Ave.
Falls Church, VA 22042
(703) 573-0736

Price: \$24 each module

Requires: 64K RAM, one disk drive, color graphics card

Age Group: 4 years to 4th grade

Description: This series consists of 4 progressive reading lessons. Extensive use of graphics, animation and sound.

CIRCLE 670 ON READER SERVICE CARD

Rhymes and Riddles
Spinnaker Software
215 First St.
Cambridge, MA 02142
(617) 868-4700

Price: \$29.95

Requires: 64K RAM, one disk drive, color graphics adapter

Age Group: 5 to 9 years

Description: A letter-guessing game presented in three formats: nursery rhymes, riddles, famous sayings.

CIRCLE 662 ON READER SERVICE CARD

Snooper Troops Comes 1 and 2
Spinnaker Software
215 First St.
Cambridge, MA 02142
(617) 868-4700

Price: \$44.95

Requires: 64K RAM, one disk drive, color graphics adapter

Age Group: 5 to 10 adult

Description: Players are detectives trying to determine who perpetrated the crime and what the motive was.

CIRCLE 679 ON READER SERVICE CARD

The Speed Reader
Davidson and Associates
8069 Groveoak Pl. #14
Rancho Palos Verdes, CA 90274
(213) 378-7826

Price: \$74.95

Requires: 64K RAM, two disk drives

Age Group: 10 to adult

Description: Speed Reader teaches students to read faster and with greater comprehension.

CIRCLE 678 ON READER SERVICE CARD

SpellBound

Davell Custom Software
P.O.Box 4182
Cleveland, TN 37311

Price: \$79

Requires: 64K RAM, two disk drives

Age Group: 10, and up

Description: Teaches current spelling/
vocabulary homework with 13 user-
programmable games.

CIRCLE 661 ON READER SERVICE CARD

Spellicopter

DesignWare
185 Berry St.
San Francisco, CA 94107
(800) 572-7767, (415) 546-1866

Price: \$39.95

Requires: 64K RAM, one disk drive, color
graphics adapter

Age Group: 1st grade to adult

Description: Action spelling game.

CIRCLE 665 ON READER SERVICE CARD

States and Capitals

The Software Guide
18 Oak Tree Lane
Little Falls, NJ 07424

Price: \$24.95

Requires: 64K RAM, one disk drive,
BASICA, color graphics card

Description: Drill and practice on recogni-
tion of states of the US and their capital
cities.

CIRCLE 668 ON READER SERVICE CARD

Story Machine

Spinnaker Software
215 First St.
Cambridge, MA 02142
(617) 868-4700

Price: \$34.95

Requires: 64K RAM, one disk drive, color
graphics adapter

Age Group: 5 to 9 years

Description: The child writes stories with
a supplied vocabulary. The story is
then animated on the screen.

CIRCLE 663 ON READER SERVICE CARD

NOW YOU CAN WORK IN C WITH ONLY BASIC KNOWLEDGE



Enjoy the Best of Both Worlds with BASIC_C™!

Until now, IBM BASIC and UNIX C were about as far apart as apples and oranges—and if you wanted to move from BASIC to C, you had to go back to square one. Not anymore!

You already know what C can do for you: structured programming, tight code, very portable software. But why should you have to give up BASIC's friendly set of powerful functions? With BASIC_C, you don't!

BASIC_C is a software development system: it has a full screen editor, a C compiler, and a library of functions that works like the BASIC that comes with every IBM PC.

You'll soon be feeling right at home: since you can still use most of your knowledge of BASIC, you'll be writing useful programs in C very quickly. Your new C programs will even read and write standard BASIC files. Imagine...No data conversion hassles!

Learning a new language is never painless but BASIC_C's documentation assumes familiarity with BASIC, not C. It walks you through a point-by-point comparison of the languages. The better you know BASIC, the easier it will be.

For more information about the attractively priced BASIC_C software development package, please call our toll-free number.

OR MAIL IN COUPON FOR MORE INFORMATION

☐ YES, Please send more information on the
BASIC_C™ software development system.

NAME _____
ADDRESS _____
CITY _____
STATE _____ ZIP _____

**1-800-821-7700
Ext. 303**

Lines Open 24 Hours A Day

SOURCE
12801 Frost Road
Kansas City, MO 64138

CIRCLE 371 ON READER SERVICE CARD

TrivQuiz

MRM Enterprises
21115 Devonshire St., Suite 250
Chatsworth, CA 91311

Price: \$29.95; additional category disks
\$12.95

Requires: 64K RAM, one disk drive
Age group: 10 and up

Description: A game to test the user's knowledge of trivia.

CIRCLE 659 ON READER SERVICE CARD

Typing Tutor
IBM Corporation
Systems Products Division

P.O. Box 1328
Boca Raton, FL 33432
(800) 447-4700

Price: \$24.95

Requires: 48K RAM, one disk drive

Age Group: 16 to adult

Description: Typing Tutor teaches the letters, numbers, and special functions of the PC keyboard.

CIRCLE 677 ON READER SERVICE CARD

Vocab Teacher
The Moonware Company
39 Sylvan Ln.
Weston, MA 02193

Price: \$25

Requires: 64K RAM, one disk drive

Age Group: 6 to adult

Description: Versatile drill and practice vocabulary lesson, with up to 100 different sessions available.

CIRCLE 676 ON READER SERVICE CARD

Word Challenge
Proximity Devices Corporation
3511 N.E. 22nd Ave.
Ft. Lauderdale, FL 33308
(305) 566-3511

Price: \$39.95

Requires: 64K RAM, one disk drive

Age Group: 10 to adult

Description: Word Challenge is a spelling game, asking the learner to find as many words as possible in a square with 9, 16, or 25 boxes.

CIRCLE 674 ON READER SERVICE CARD

WordSkill
Science Research Associates, Inc.
155 N. Wacker Dr.
Chicago, IL 60606
(312) 984-7000

Price: \$225 (includes teacher guide and 20 workbooks)

Requires: 64K RAM, one disk drive, color graphics adapter

Age Group: Grade 7, and up

Description: Vocabulary practice, emphasizing synonyms, definitions, antonyms, and analogies.

CIRCLE 690 ON READER SERVICE CARD

—R.W. and C.S.



MAINFRAME MATH FOR YOUR IBM P.C.

THE BEST HIGH SPEED MATH PACKAGE:

- The HCW Math Package makes your math intensive applications run up to 180 times faster, with better accuracy. The Math Package provides 68 high performance, high accuracy operations including: addition, subtraction, multiplication, division, square root, as well as trigonometric, exponential and logarithmic functions.
- The HCW Math Package libraries work with the IBM FORTRAN Compiler, the IBM PASCAL Compiler, and the IBM MACRO Assembler. The libraries are easy to use, and take up less room in memory!
- The HCW Math Package is supplied with complete source code, so custom functions (such as scientific, economic, graphic functions) can be easily added.
- The HCW Math Package comes with fully illustrated installation instructions. The chips are installed in carriers... no more bent pins!
- A software subscription service is included, updating you to new releases of the libraries for one year. (IBM BASIC Compiler support coming soon.)

**Now includes FORTRAN
support and one year up-
date service:**

\$325.00 Complete

Master Charge Visa and American Express accepted
See your local dealer.

Mainframe Power For Your P.C.

HCW

HAUPPAUGE COMPUTER WORKS
358 Veterans Memorial Highway, Suite M51
Commack, New York 11725 • (516) 360-3827

CIRCLE 256 ON READER SERVICE CARD

"The computer's from IBM."

"Everything else is from my connection."



A few good reasons why knowledgeable people come to PC Connection for IBM-PC peripherals and software.

First, you can talk to us—free of charge.

When you call PC Connection, we do more than just take your order. We talk to you, and we'll answer your questions about any product we sell. Because we, too, use IBM-PC's all day long. Our knowledge about IBM-PC equipment and software is your knowledge. And it costs you absolutely nothing.

Second, it's only two days from our house to your house.

When you want something for your IBM-PC, you can have it. Fast. Because, unlike mail order houses, we stock what we sell. You'll usually have your order in two days, not in two weeks or two months.

Third, we're first.

When you choose PC Connection as your supplier, you're choosing the nation's leader. We have a large selection of only the best software and peripherals;

they're available now, and there's always someone ready to answer your questions about use or compatibility.

Fourth, we're sometimes second.

If you shop around long enough, you might be able to beat our prices. But only by a minimal amount. And never by enough to make up for the knowledge and security you'll gain by connecting us to your IBM-PC.

We never charge your card until we ship, there is no surcharge added on credit cards, there is no sales tax, and we fully insure all shipments at no additional cost. And, any defective product can be returned to us within 120 days for immediate repair or replacement.

Write or call us for a complete price list.
PC Connection, 6 Mill Street, Marlow, New Hampshire 03456. In N.H. call 603/446-3383.

800/243-8088

"PC CONNECTION is my connection."

CIRCLE 339 ON READER SERVICE CARD

Curtis Manufacturing • Softwood Systems • Hayden • Quadram • Lotus Development • Ashton Tate • Epson • Software Publishing • IUS • Pearl Soft • Financier • Integral
ata Systems • Mouse Systems • Application Techniques • PC Software • Best Programs • Satellite Software • Friendly Soft • Princeton Graphics • Tandon • Microsoft • Hayes
AST Research • Software Arts • VisiCorp • Digital Research • RoseSoft • Comprehensive • Spinnaker • Verbatim • Conceptual Instruments • Peachtree • Sercim • Lifetree

PC CONNECTIONTM

Your after hours Monday thru Saturday

SOFTWARE

ApTec (for color Prism Printers)	
Rainbow Winter Color Text Formatter	\$119
Rainbow Winter Screen Grabber	.69
Ashton Tate	
dBase II (DOS or CP/M-86)	389
Friday	call
Best Programs	
PC/Personal Finance Program	65
PC/Professional Finance Program II	145
PC/Fixed Asset System	279
Bible Research	
THE WORD (KJV Bible - 7 disks)	145
Continental	
Home Accountant Plus	95
FCM (was First Class Mail)	79
UltraFile (file/report/graph)	127
Conceptual Instruments	
The Desk Organizer (1 yr. free updates, 30 day return guarantee, now has Meta Command)	250
Digital Research	
CP/M-86	39
DR LOGO	109
Financier	
Financier Personal Series	119
Financier Tax Series	119
Hayden	
PIE Writer	149
Hayes	
Smartcom II	79
IUS (XT and DOS 2.0 compatible)	
EasyWriter II	195
EasySpeller II for EasyWriter II	129
A/R, A/P, G/L	each 339
Package Price for A/R, A/P, G/L	879
Inventory	339
Order Entry	339
Lifetree	
Volkswriter	119
Volkswriter International	149
Volkswriter Deluxe	call
Link Systems	
Datafax	189
Lotus Development	
1-2-3 (version 1A — the newest!)	call
Micropro	
WordStar 3.3	269
ProPak (WordStar/MailMerge/ SpellStar/StarIndex)	397
Microsoft	
Multiplan	169
Multi-Tool Financial (for Multiplan)	69
Multi-Tool Budget (for Multiplan)	99
Multi-Tool Word (with mouse)	349
Microstuf	
Crosstalk XVI	109
Transporter (includes Crosstalk XVI)	169
PCsoftware	
PCrayon (create in full color with easy to use graphics tool)	39
CREATABASE	59

PC Connection Software Special

through November 30, 1983

PETER NORTON

Norton Utilities

- Super utility package
- Works on any IBM-PC or XT
- Works with all DOS versions

ROSESOFT

ProKey

- Customize your keyboard
- Eliminate repetitive typing
- One key can issue a whole
series of commands

PACKAGE PRICE FOR BOTH \$99

Peachtree	
Peachtree 5000	\$237
Pearlsoft	
Personal Pearl	189
Peter Norton	see above special
Norton Utilities	55
RoseSoft	see above special
ProKey (customize your keyboard)	59
Software Arts	
TK/Solver	219
Financial Management Pack	87
Mechanical Engineering Pack	87
Software Publishing	
PFS:File	95
PFS:Graph	95
PFS:Write	95
PFS:Report	79
Software Systems	
Multimate	call
Sorcim	
Supercalc II	159
System Software Services	
PCModem 1.3 (for Smartmodem 300)	39
PCModem 1.4C (for Smartmodem 1200)	69
VisiCorp	
VisiCalc II (w/StretchCalc)	165
VisiFile	195
VisiSchedule	195
VisiTrend/Plot	195
VisiWord	269
VisiSpell	159

EDUCATIONAL

Comprehensive	
PC Pal (for first time users)	27
PC Tutor 1.1 (more in depth instruction)	55
PC Tutor 2.0 (more in depth instruction)	55
FriendliSoft	
FriendliWare/PC Introductory Set	39
Lightning Software	
Mastertype	34
Spinnaker	
Educational Games for Young Computer Users (requires graphics board)	
Snooper Troops I (ages 10 to adult)	30

Snooper Troops II (ages 10 to adult)	\$30
Most Amazing Thing (ages 10 to adult)	27
Face Maker (ages 4 to 12)	23
Story Machine (ages 5 to 9)	23
Kinder Comp (ages 3 to 8)	23
Rhymes and Riddles (ages 5 to 9)	20
Hey Diddle Diddle (ages 3 to 10)	20
Stone (requires graphics board)	
My Letters, Numbers, and Words (great graphics and sound — ages 1 to 5)	29

GAMES

Broderbund	
Apple Panic	23
EPYX/Automated Simulations	
Temple of Apshu	27
Upper Reaches of Apshu	15
Curse of Ra	15
Star Warrior	27
Rescue at Rigel	23
Crush, Crumple, and Chomp	23
FriendliSoft	
FriendliWare/PC Arcade	39
Funtest!	
Snack Attack II (a favorite)	27
Cosmic Crusader (as good as above)	27
Big Top (hours of fun!)	29
Master Miner (1 or 2 players)	29
Infocom	
High quality text games	
Zork I	27
Zork II	27
Zork III	27
Starcross	27
Deadline	35
Suspended	35
Witness	35
Planetfall	35
Microsoft	
Fight Simulator (with 93 page manual)	35
ScreenPlay (mono or graphics board)	
Asylum	29
Dunorth (with voice)	29
Sierra/On-Line	
Frogger	27
Crossfire (keyboard or joystick)	23
Ulysses and the Golden Fleece	27
Strategic Simulations	
The Warp Factor	27
Tigers in the Snow	27
Epidemic	25
Sublogic	
Night Mission Pinball	29
Zee Programming	
Zuran Defender (highly addictive)	25
INFORMATION SERVICES	
Compuserve	
Compuserve (includes subscription, manual, 5 hours of connect time, and monthly publications)	39
Source Telecomputing	
The Source (subscription & manual)	69

* OUR NEW HOURS START NOVEMBER 1.

rs connection.

day, 9 a.m. to 9 p.m.*

HARDWARE

AST Research (For IBM-PC or XT)

We are a full line AST Research Dealer

All AST Boards come with SuperDrive, SuperSpool, and one year warranty. SuPakPlus 64k upgradable to 384k, with clock calendar, serial and parallel ports (game port optional) . . . \$269.

MegaPlus II 64k upgradable to 256k (or more with MegaPak) with clock calendar and serial port (parallel, game, or second serial port optional) . . . 269.

MegaPak 128k (not upgradable) . . . 187.

MegaPak 256k . . . 279.

IIQ Plus II with clock calendar and serial port (parallel game or second serial port optional) . . . 115.

Parallel, game, or serial port for any AST board (specify board) . . . 35.

Connectal connector bracket (PC only) . . . 15.

Amdak
MAI Board (color & monochrome) . . . 469.

CompuCable
Plastic Keyboard & Drive Covers (set) . . . 19.

Printer to IBM Cable (specify printer) . . . 32.

Curtis . . . see above special

Electronic Protection Devices
All come with Lloyds of London insurance coverage. All are rated at 1875 watts, 15 AMP.

The Lemon . . . 44.

The Lime . . . 69.

The Peach . . . 69.

The Orange . . . 99.

Epson
FX-80 with GRAFTRAX-Plus . . . call.

FX-100 with GRAFTRAX-Plus . . . call.

Epson to IBM Parallel Cable . . . 32.

FTG Data
Light Pen (Push Tip) . . . 159.

Demo Disk Set for Light Pen . . . 39.

Hayas
Smartmodem 300 . . . 209.

Smartmodem 1200 . . . 499.

Smartmodem 1200B (w/Smartcom II) . . . 439.

Smartcom II . . . 79.

Smartmodem-to-IBM Cable (CompuCable) . . . 25.

Hercules Computer
Hercules Graphics Card (parallel port) . . . 359.

IDS
Prism 80 Printer (with all 4 options) . . . 1397.

Prism 132 Printer (with all 4 options) . . . 1597.

Prism to IBM Parallel Cable . . . 32.

key tronic
Typewriter style keyboard . . . 193.

Kraft
Joystick . . . 45.

PC Connection Hardware Special

through November 30, 1983

CURTIS MANUFACTURING

Make your PC more comfortable and more productive

PC Pedestal
fits IBM mono or color display . . . \$59

System Stand
holds your PC or XT vertically . . . 19

3' Extension Cable Set
for IBM-PC Mono Display . . . 39

Keyboard Cable
3' to 9' extension . . . 32

PACKAGE PRICE FOR ABOVE . . . 139.

Adaptor for PC Pedestal
for Princeton or Quadchrome Display . . . 8

CONNECT WITH US

Need more information on our products? Buying your first PC or XT and want advice on hardware compatibility and software performance? Call us. We have the IBM-PC experience. Monday through Friday 9:00 to 5:30 at 603/446-3383

OUR POLICY

- We do not charge your card until we ship.
- No surcharge added on VISA and Mastercard.
- No sales tax.
- We fully insure all shipments at no additional charge.
- Allow one week for personal and company checks to clear.
- COD maximum \$500. Cash or certified check.
- 120 day guarantee: Defective software replaced immediately. Defective hardware replaced or repaired at our discretion. Some items have warranties up to five years.

United States: For monitors, printers, and drives, add 2% to all orders. For all other items add \$2 per order for UPS surface, \$3 per order for UPS 2nd Day Air. **Canada and Mexico:** We add freight charges to credit card purchases. For prepayment, include 3% for monitors, printers, and drives. For all other items, add \$4 per order for shipping charges.

800/243-8088

PC Connection, Inc.

6 Mill St., Marlow, NH 03456

603/446-3383

For the IBM-PC Exclusively.

Maynard Electronics

Floppy Drive Controller . . . \$159

Microsoft

System Card 64k (upgradable to 256k) with clock calendar, serial port, parallel port . . . 289.

Mouse Systems

PC Mouse (3 button optical mouse comes with power supply, desk pad, and software — connects to serial port) . . . 239

NEC

Spinwriter 3550 (IBM-PC compatible) . . . 187B.

Plantronics/Frederick

COLORPLUS . . . 379.

Princeton Graphics

PGS (RGB Monitor now displays brown) . . . call

Quadram

We are a full line Quadram Dealer

Quadboard 64k (upgradable to 256k, with Quadmaster Software, clock calendar, serial and parallel ports) . . . 269.

Microbase Printer Buffer (parallel) w/copy MP 64 (64k) upgradable to 512k . . . 188.

Quadchrome (Hi Res RGB Monitor) . . . 497.

Quadlink (allows you to run most Apple II programs directly on your IBM-PC or XT) . . . call

Silver Reed (letter quality)
Silver Reed EXP 550 Printer 132 column, quiet, smooth, and solid . . . 649

Star Microdots

Gemini 10X (totally Epson compatible) . . . 319.

TG

Joystick . . . 45.

Tandon

TM 55-2 (5 1/4") half-height drive (DS,DD)

TM 100-2 (5 1/4") full-height drive (DS,DD) specify Drive A or Drive B for your PC.

Comes with complete step by step installation instructions . . . 259.

USI (monitors for graphics board)

P-2 Monitor (12" green, with cable) . . . 149

P-3 Monitor (12" amber, with cable) . . . 164

MEMORY

64k Memory Upgrade Set for IBM-PC or XT system board . . . 59.

64k Memory Upgrade Set for any memory board specify make of board . . . 59.

Install memory upgrades and run

diagnostics at time of board purchase only . . . 10.

DISKS

Verbatim (with 5 year guarantee)

Datatype Disks SS/DD plastic box of 10 . . . 29.

Datatype Disks DS/DD plastic box of 10 . . . 39.

Flip Sort (holds 75 disks) . . . 19.

PC CONNECTION™

DEAR SANTA, I'VE BEEN A GOOD COMPUTER. HERE'S MY LIST... ...P.C.

**NEW
PRODUCT**

**ORGANIZE
& PROTECT**



ROLLTOP 100 DESK FILE™

Model #RT100

Twice the capacity (100 - 5-1/4" Disks) of the leading "flip top" file. But it takes no more desk space! An outstanding design that combines contemporary styling with the elegance of a rolltop enclosure and a textured buff plastic body. It includes 10 diskette dividers and anti-skid feet. Locking Model #RT100L - \$46.00

\$36.00

**INCREASE
COMFORT**



TILT 'N TURN

Model #PA900

Work easier! Reduce glare and eye strain, eliminate neck craning with this sturdy CRT display stand. Tension spring allows completely stable 30° tilt and 360° turn without removing CRT. Attractive molded ivory hard plastic and steel construction. Rubber pads on top and bottom assure no slipping. Fits any CRT with feet separation less than 11" in width and 10-1/4" in depth.

\$40.00

**GAIN
SPACE**



KEYBOARD STORAGE DRAWER

Model #SS610

Where do you put the keyboard? This clever accessory is the perfect solution to narrow credenzas or typewriter return locations. The keyboard drawer rolls smoothly on industrial strength ball bearing slides. The drawer locks open for stability and has a built-in wrist rest pad. The Keyboard Storage Drawer is constructed of reinforced 20 gauge steel with a baked enamel finish. The entire unit is finished in putty and grey to match the IBM PC color scheme. It will hold any keyboard 2-3/4" (h) x 19-3/4" (w) x 9-1/2" (d). **\$89.00**

\$5.00 Shipping/Handling for this item.

PROTECT



KEYBOARD COVER

Model #KC210

Protect your computer keyboard with our dustcover made from rigid smoked bronze plastic. A low silhouette design that fits keyboards with a key working area of 16-1/2" (w) x 4-1/2" (d), such as the IBM PC and the Keytronics keyboard.

\$12.00



DISK DRIVE COVER

Model #DC310

A custom design cover to protect the IBM PC disk drive area from dust and dirt. Molded in black plastic to match the IBM Contemporary styling. The vinyl foam seal around its perimeter prevents harmful elements from entering the disk drive area.

\$10.00



**GAIN
SPACE**

UNDER CARRIAGE PLATFORM DRAWER
Model #UP620 \$54.00

The sliding cantilever drawer and ball bearing slides, described before, is modified to suspend under the top of a desk, a shelf, or table top. Fits a space 3-1/4" (h) x 21" (w) x 15" (d). Fully extended, the platform drawer is at a very comfortable typing height.



KEYBOARD STORAGE STAND
Model #KS630 \$44.00

A baked enamel, reinforced 20 gauge steel platform 3-1/2" (h) x 22" (w) x 15-1/2" (d) that supports and raises the System and CRT 3-1/2" providing storage for the keyboard.



ORGANIZE

NOW-WITH BOTTOM SLOT

PRINTER STAND
Model #PS920

Elevates printer for smooth paper feed and storage.
• Baked enamel, reinforced 20 gauge steel platform
• Felt pads reduce noise and vibration
• Supports up to 100 lbs. without "bowing"

\$30.00

- Model #PS920 (shown) 5-1/2" (h) x 21-1/4" (w) x 13" (d) for paper 14-7/8" wide
- Model #PS910 is 5-1/2" (h) x 15" (w) x 13" (d) for paper 8-1/2" wide - \$25.00



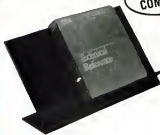
**INCREASE
COMFORT**

**NEW
PRODUCT**

ANTI-GLARE SCREEN FILTER
Model #AG820

Reduce eye strain and increase operator comfort with this screen filter for the IBM PC monochrome monitor. The filter reduces excessive glare from overhead lighting. It fits snugly into the face of the monitor due to the vinyl foam bordering the narrow but sturdy aluminum frame. The screen is made of black nylon monofilament fibers in a square weave.

\$35.00



**INCREASE
COMFORT**

EASY-VUE EASEL
Model #EV410

The ultimate design in a manual easel. Provides ideal viewing angle. Protective pads prevent skidding. 10" x 15" in size, it even properly displays an 8-1/2" x 11" three ring binder. An elegant accessory in smoked bronze, molded from tough durable acrylic.

\$24.00

Available at many leading computer and software retailers. Ask your local dealer for our products.

Order today from your local dealer or direct. Most orders shipped UPS within 48 hours. Add \$3.00 Shipping/Handling. Mastercard or Visa accepted, or send a check or money order to:

**MicroComputer
Accessories, Inc.**

1545 Pontius Avenue
Los Angeles, CA 90025
(213) 477-4216



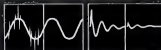
BEFORE YOU DAMAGE YOUR COMPUTER, PLUG IT IN RIGHT.

INTRODUCING THE WIRE TREE™ AC SURGE PROTECTOR, FROM NETWORKX.

Power surges and voltage spikes. Their causes can be as simple as someone opening your refrigerator, or running a power tool, or switching on a fluorescent light.

But their results can be devastating. They can wipe out your computer's memory. Even damage its sensitive circuits.

That's why smart computer users protect their personal computers by plugging them into The Wire Tree from NetworkX.



Voltage
surge enters
The Wire Tree.

Constant
power out-
put

R.F. inter-
ference enters
The Wire Tree.

Filtered
power out-
put

The Wire Tree has four outlets and provides power surge protection that conforms to IEEE guidelines.

It comes with a bracket to mount underneath your desk or table and has a unique cable support feature which organizes your system's power cords into a neat bundle and moves them out of your way. And it lets you control system power from a single illuminated on/off switch.

You've invested a lot of time and money in your computer system. Protect that investment with The Wire Tree. Ask for one at your local computer store.

NETWORKX

NetworkX, Brooklyn, N.Y. 11237 (212) 821-7555

CIRCLE 454 ON READER SERVICE CARD

In the flash of one second, Delta-10 can print the alphabet six times.

At 160 cps, 100% duty cycle, Delta-10 is built for speed. It's the dot matrix printer that quickly strikes up an intense working relationship with your computer.

There's no nonsense. Delta-10 performs with serial and parallel interfaces as standard. The 8K buffer gives Delta-10 the power to instantaneously store and print data as it frees your computer to continue its job. Turn Delta on

and it can print three crisp copies simultaneously at the continuous speed of 160 cps.

And Delta-10's performance isn't only measured in swiftness. There's the diversity of its character fonts, its true descender matrix, and its underlining ability.

Star's new Delta-10. Designed for red-hot efficiency. And isn't that what you need?

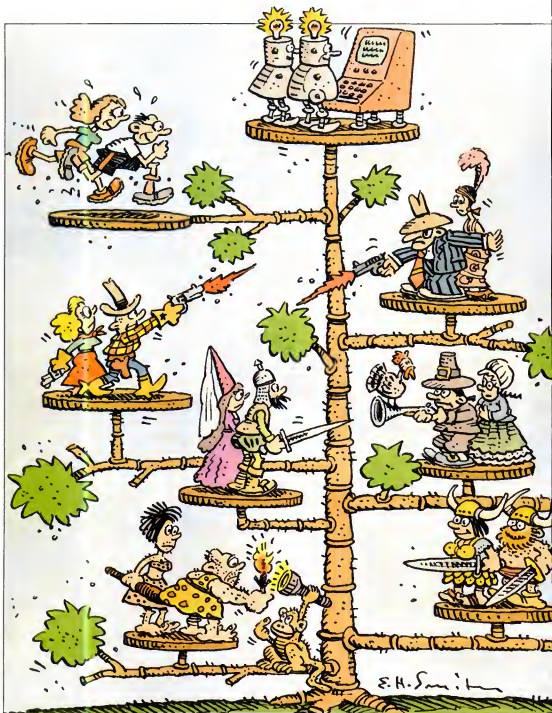
star
MICROELECTRONICS

THE POWER BEHIND THE PRINTED WORD.

Computer Peripherals Division
P.O. Box 612166, Dallas/Ft. Worth Airport, TX 75261



CIRCLE 396 ON READER SERVICE CARD



Genealogical charts, along with notes on your family's past, can be stored and manipulated with this software package.

Family Roots Puts A Cursor On Your Precursors

The television miniseries "Roots," based on Alex Haley's best-seller of the same title, kindled a widespread interest in ancestries. Rootsmania spurred countless genealogical hunting expeditions, interviews with family elders, and courses in local and family history.

For many, exploring their roots meant days devoted to reeling microfilm newspapers and census records; scouring dusty county history books; writing to military, religious, and government organizations across the country; and tramping through overgrown cemeteries trying to decipher weathered inscriptions on moss-encrusted tombstones. There was a mystique about the quest, a feeling that important clues to one's own self were waiting. These were real mysteries to solve, and

heroes, rogues, and just plain folks to find.

Whatever the motives—romantic or practical—the result of all that searching was the creation of notebooks and yellow pads filled with names, dates, places, occupations, and relationships. That's where *Family Roots* and the IBM Personal Computer come in.

Family Roots is an amazingly versatile program designed to manipulate, cross-reference, and display data. If you have single-sided drives, the package comes with two disks, one with main programs and the other with auxiliary programs. All the programs are available on a single disk for double-sided drives.

The well-written, well-organized, and detailed manual comes in a loose-leaf

PC GT™

Now the **experienced** multiuser leader leaves the single-user crowd behind.

For over two years Sierra Data Sciences has been delivering advanced multiuser systems to science and industry.

Now that advanced experience is available to PC users in an extraordinary new product...PC-GT.

PC-GT allows any IBM PC or IBM-compatible PC to become a powerful multi-user system. Each user gets a separate processor. No processor sharing. No reduced performance. No costly additional PCs.

Simply add one PC-GT

user expansion card, and one ASCII CRT for each additional user. Only one of Sierra Data's unique M*DOS disks is necessary no matter how many users are added. No software changes. No re-compilations. No re-installations.



From Single-User Crunch...



to Multiuser Luxury.

Get more access to your PC today. Order PC-GT now or contact: **216-892-1800**

See us at Comdex in Las Vegas Booth H7036

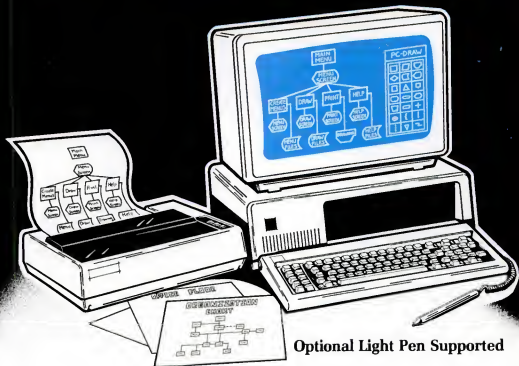
**HARDWARE
SOFTWARE**



SIERRA DATA SCIENCES

Fresno, CA
Product Support Division • 25700 First Street • Westlake, OH 44145
(216) 892-1800 • TELEX: 980131 WDMR
CIRCLE 437 ON READER SERVICE CARD

PC-DRAW, The Original High Resolution Drawing System for the IBM PC. Now with Color and Plotter Support!



Optional Light Pen Supported

Reduce costly and time consuming preparation/revision of charts, diagrams and other Business Documentation. With PC-Draw's user definable symbol menus, extensive Graphic Functions, Multiple Text Fonts and Predefined Symbol Menus* you can Create, Maintain and Print virtually any type or complexity of drawing.

PC-Draw will help you achieve immediate productivity gains in the following application areas:

- Flowcharting
- Organizational Charts
- Forms Design
- Office Layouts
- Warnier/Orr Charts
- Architectural Design
- Mechanical Design
- Electrical Design
- Yourdon Structural Analysis/Design
- And other Drawing Applications

*Three predefined symbol menus come with PC-Draw. They are: Software Design, Electrical Design and Alternate Text.

MICROGRAFX

1701 N. Greenville
Suite 703
Richardson, TX 75081
(214) 343-4338

Name _____
Street _____
City _____ State _____
Zip _____ Phone _____
Amount Enclosed _____
☐ Visa ☐ M/Cr _____
Exp. Date _____

_____ PC-Draw(s) @ \$250**
_____ Light Pen(s) @ \$150**
_____ Plotter Support(s) @ \$50**

Signed _____

Dealer Inquiries Welcomed

binder: It includes a 5-page section near the end devoted to some common problems and a short appendix explaining the few special characters you'll need to learn. The manual contains an ample number of figures and tables to explain the narrative. Written in conversational style, the documentation is generally easy to follow. The user is guided through each step: from putting DOS files onto the program diskette and configuring hardware, through developing genealogical charts, to printing a mailing list with addresses of living relatives.

Adding to the program's flexibility is its ability to change parameters for each program. When printing charts, for example, you can control print size, decide whether to use names or numbers to label months, choose whether a woman's married name or maiden name will appear, and more. In printing out information for an individual or a family group, you can decide to arrange children by birth date, choose between having first names or last names appear first, and pretty well customize the printout to meet individual needs.

Family Roots provides six major programs and seven utilities, all accessed through a main menu with 13 options (see

***B**EFORE YOU can enter the date of birth, you have to go back to the main menu and punch up the name you have just entered.*

Figure 1). Starting with the data entry program EDIT, you can develop individual records (see Figure 2). At this point, the program (as it now exists) requires you to take an annoying extra step. To create a record, you first must enter the subject's name. However, before you can enter the date of birth and other information, you have to go back to the main menu and punch up the name you had just entered.

I also ran into a bug with the version of the program used for this review. After entering my 75th record, I got an error message and couldn't add the 76th; I had to go to the 101st, thereby losing space for 75 records. There should be room for

about 550 records on a double-sided double-density diskette. Family Roots' author Stephen C. Vorenberg said he's received similar complaints of error messages occurring after a multiple of 25 is reached; the program stores records in groups of 25. Vorenberg said the problem has been corrected in an updated version of the program. Registered owners of the earlier version will be notified by the manufacturer, Quinsept, Inc., of the availability of a new diskette with a "fixer" utility. Upon notification of a problem, Quinsept will send the new diskette to these users.

Setting the Tables

The standard record fields—date and place of birth, death, marriage, parents, and children—can be supplemented with up to nine user-defined fields. I added occupation, place of burial, college, and sex. The last category may seem unnecessary, but users may run into ancestors and relatives with names that are ambiguous as to gender—for instance, I came across Amasa Washburn (male) and Percy Smith Washburn (female). The EDIT function also permits you to include footnote information, such as source material, for each record. Once the footnotes are entered, sequential numbers are assigned to them

Family Roots

Quinsept, Inc.
P.O. Box 216
Lexington, MA 02173
(617) 862-0404

List Price: \$185

Requires: 96K, one to six disk drives, printer.

CIRCLE 619 ON READER SERVICE CARD

Figure 1: The main menu of Family Roots, showing the six major programs and seven utilities.

Choose which program to run, by numbers:

- 1) EDIT (Data Entry)
 - 2) CHARTS (Pedigree/Descendants)
 - 3) SHEETS (Person and Group Sheets)
 - 4) SEARCH (Examine Family Data)
 - 5) TEXT (Free Text)
 - 6) LISTS (Lists of Names)
 - 7) KEYDEF (Define function keys)
 - 8) WHAT (Analyze Diskette)
 - 9) CONFIG (Set up Parameters)
 - 10) CREATE (Make Empty Diskettes)
 - 11) ADDRESS (Name Address List)
 - 12) BLANKS (Empty Charts)
 - 13) REMBER (Reassign ID #)
- WHICH (1-13)?

Figure 2: A typical individual record.

```
Eric Freedman (ID=1)

1) BORN ON: 11061949
2) BORN AT: Brookline MA
3) DEATH DATE OR 'LIVING': L
4) DIED/LIVING AT: 5 Arden Lane; Troy NY; 12180
5) SEX: M
6) OCCUPATION: reporter
7) COLLEGE: Cornell, NYU Law
8) BURIAL PLACE:
9) FATHER: Morris Freedman (ID=5)
10) MOTHER: Charlotte Leah Nadler Freedman (ID=6)
11) NUMBER OF MARRIAGES: 1
12) SPOUSE #1: Mary Ann Sipher (ID=2)
13) MARRIED ON: 05241974
14) MARRIED AT: Cayuga Heights NY
15) MARITAL STATUS: M
16) NUMBER OF CHILDREN: 2
17) CHILD 1: Ian Sipher Freedman (ID=3)
18) CHILD 2: Cara Sipher Freedman (ID=4)
19) NUMBER OF NOTES:
```

ANY CHANGES TO BE MADE HERE (Y/N/S/P)

[illegible]

As you enter answers prompted by the menu, certain types of information will expand the record fields on the screen. For example, if you give a response for a number of children, the list will automatically be reconstituted to provide space for the name of each child. If you enter more than one marriage for a given subject, the list will provide lines for each spouse's name and for the date and place of each marriage.

One of the principal attractions of the system is its cross-referencing or complementing capability. Let's say you've set up records for yourself (ID=1), your parents (ID=7 and ID=8), your spouse (ID=2), and several children (ID=9, ID=10, and ID=11). Instead of entering each name in the appropriate field for each record, you can fill in the person's record number to

ONE OF
the principal attractions
of the system is its
cross-referencing or
complementing
capability.

create a cross-reference that saves space on your data disk. If you enter an address for a spouse or a parent, the program will ask whether certain other relatives live there too. If so, that address will automatically appear in the correct field in the other records.

Editing records is relatively easy. You select the ones you want to edit by listing the record numbers, providing a range of numbers, or by name. A minor annoyance, if you generally rely on the cursor control key (number 4 on the numeric pad) to back up, is that you must use the regular backspace with Family Roots. To clear a field, use Control E.

The concept of computerized genealogy would have been alien to such people as Comfort Day (1740-1799), a Revolutionary War soldier and veteran of the Battle of Bunker Hill; or Catherine Windecker

BREEDER PUTS THE FUN INTO LIFE

BREEDER from **PROTIUM** is an implementation of John Horton Conway's game of **LIFE** for the IBM PC. Based on experiments in cellular automata, **BREEDER** allows you to create fascinating patterns by applying the genetic rules of **LIFE** to seed patterns of your choice. **BREEDER**, written in assembly language, allows the display of up to 10 new generations per second in a universe of 160 by 100 cells. Monochrome and color display support allow **BREEDER** to run on any PC configuration with just 64k of memory. A store and retrieve library contains 100 patterns.

To order, just send the completed coupon with your check, money order or Visa/MasterCard number to:

PROTIUM
Suite 399
5580 La Jolla Blvd.
La Jolla, CA 92037

California residents add 6% sales tax. Please allow six (6) weeks for delivery.

Name _____
Address _____
City _____ St. _____
Zip _____

Please send me _____ copies of **BREEDER** at \$39.95 each.

CIRCLE 518 ON READER SERVICE CARD

Sipher, a weaver and spinner who died in 1850; or James Truax, a nineteenth-century farmer and blacksmith. But taking information about these people—discov-

THE CONCEPT of computerized genealogy would have been alien to such people as Comfort Day (1740-1799).

ered in research by Donald Sipher, my wife's cousin—I experimented with the other major Family Roots programs.

A CHARTS function gives you a choice of formats for pedigree and descendants charts, including family trees. There is a free-form chart for descendants (see Figure 3) and three varieties of charts for predecessors. The adjustable parameters for any of these charts make it possible to print names only, or to have ID numbers and biographical data appear with each entry. If research takes the user far back into family history, the standard default

maximum of seven generations can be expanded.

Although EDIT is used to store data according to standardized fields, it does contain a footnoting capability. If that does not provide enough space, call up the TEXT program, where you can enter, retrieve, and print textual material in free form and store it on separate text diskettes. In contrast to notes, which have to fit into the space allocated to an individual record, TEXT entries are limited only by the space on a diskette. Variable parameters include control over margins, tabs, and lines per printed page.

The SHEETS program is used to display or print data for a family group or a single person, following the format used by the Mormons (see Figure 4). It, too, offers the chance to alter a number of default parameters. If you've used TEXT, the relevant narrative material can be appended to the sheet.

From its name alone you probably can guess what the LISTS program does. Its main job is to provide alphabetical or numerical listings of records, but it also can be used for special purposes, such as merging two alphabetical lists or locating unused ID numbers so that they can be recycled. A bonus is what Family Roots calls Soundex. This feature can search

Figure 4: Family group data as organized in the Mormon format.

HUSBAND: Eric Freedman (10-1)					
Born	26 Nov 1949	Place	Brookline MA		
Marr	24 Aug 1974	Place	Coyote Heights NH		
Died		Place			
Bur.		Place			
HUSBAND'S		HUSBAND'S			
FATHER: Morris Freedman (10-5)		MOTHER: Charlotte Leah Nadler (10-4)			
HUSBAND'S					
OTHER WIVES:					
WIFE: Mary Ann Sipher (10-2)					
Born	05 Feb 1949	Place	Gouverneur NY		
Died		Place			
Bur.		Place			
WIFE'S		WIFE'S			
FATHER: Erben Walter Sipher (10-6)		MOTHER: Isida Elizabeth Mallin (10-9)			
WIFE'S					
OTHER HUSBANDS:					
W/F	CHILDREN	WHEN BORN	WHERE BORN	FIRST MARRIAGE	WHEN DIED
1 M Ian Sipher Freedman (10-3)		15 Jan 1976	NY NY		
2 F Cara Sipher Freedman (10-4)		26 Mar 1979	Albany NY		
SOURCES OF INFORMATION				OTHER MARRIAGES	

data diskettes for surnames (at birth or as changed by marriage) that sound similar but are spelled differently. When I tried Soundex, it produced some hits and some misses. The documentation cautions, "Don't expect the results of sound-alike searches to produce perfect results. There is still a bit of art in this particular science." Even so, it's fun to play around with Soundex.

To discover how many roofers, accountants, or tailors there were in a family, or how many ancestors were born in South Dakota, SEARCH is the program to use. The user types in the type of information to be looked for and specifies the fields and records to be searched. The resulting list can be displayed on the monitor (see Figure 5), printed, or stored on a diskette.

Seven utilities also are accessible from the main menu. CONFIGURATION is used to set record parameters, hardware configurations, and default values for parameters. KEYDEF can assign temporary values to dedicated function keys, F1 through F10. This is most handy if you want to make frequent entries of specific surnames or geographic locations. Each key has a capacity for strings of up to 15 characters.

BLANKS will print blank charts in the standard format; you specify the number to be printed. CREATE sets up empty data diskettes. RENUMBER is used to reassign ID numbers. WHAT checks and identifies diskettes to tell you whether they contain programs, data, or text. For standard data

diskettes, the user is given additional information, including the number of people recorded on it. ADDRESS is used to print a list of people who are identified in the records as alive and for whom addresses have been entered.

A Heritage on Disk

For keeping a simple record of grandparents and parents, Family Roots would be a costly and unnecessary investment.

**WHEN I
tried Soundex, it
produced some hits and
some misses. Even so,
it's fun to play around
with Soundex.**

But if you're making an effort to trace your family roots, this program can prove valuable—not as a substitute for research, but as a tool for making the most of the information that is unearthed. Using Family Roots on a PC also might be a futuristic way to get kids interested in their predecessors. And finally, if you're habitually hard-pressed to think of appropriate gifts for uncles, aunts, and cousins, a printout of the family tree can be a thoughtful way to tend to all your roots. /PC

Figure 5: The SEARCH program can be used to produce a classified list; in this case, the names of farmers were extracted from the data.

Choose the type of output:

1) farmer

Which (1-1,P)?

The following names in memory satisfied the search that you have done:

- 8) Sipher, Erton Walter
- 10) Sipher, David
- 12) Sipher, Paul Erton
- 31) Sipher, Ernest Walter
- 33) Sipher, John William
- 36) Meservey, Alphaus
- 41) Hurst, James
- 44) Hurst, Erton Alexander
- 47) Wilson (Willson), Robert
- 52) Truax, John
- 54) Truax, James
- 55) Truax, Walter Joseph
- 58) Sweet, Joshua
- 66) Washburn, Perry G.

Press any key to continue

Find Out about the wealth of public domain and user supported soft- ware written for the IBM PC



**At your computer book-
store or \$2.95 plus \$1
shipping and handling
from us.**

Directory of software available including Word Processing, communications, data base BASIC utilities, games using color graphics, Pascal and assembly language programs, FORTH language, graphics drawing utilities, spreadsheet templates, RAM disks, spoolers and more... over 75 disks worth.

Public domain programs are almost all available in source code form allowing the user to make modifications as well as learn programming techniques on the IBM PC.

Programs on Disk

Set of 10 introductory disks ... **\$59**
File system, modem communications, spooler, RAM disk, BASIC utilities, FORTH language, games.

Set of 20 most popular disks ... **\$114**
Above set plus word processing, color graphics, many games and text processing utilities.

Disks also sold individually. Most disks are single sided in DOS 1.1/2.0 compatible format.

(CA residents add 6.5% sales tax.)

PC Software Interest Group
1556 Halford Ave. Suite #130
Santa Clara, CA 95051
(408) 247-6303

CHAIRMAN OF THE BOARDS

MYLEX



THE Graphics Card for IBM PC/XT You've been waiting for !!!

Using a single expansion slot, the MYLEX CHAIRMAN replaces the IBM monochrome display/parallel printer adapter and color/graphics adapter card. In addition, the MYLEX CHAIRMAN is fully compatible with all PC/XT software for monochrome, color graphics and alpha-numeric modes. That's right, no changes and no modification required to your software to incorporate IBM standard graphic modes on most monochrome monitors.

THE MYLEX CHAIRMAN CARD FEATURES:

- Graphics on IBM monochrome monitor
- Shades of green on monochrome monitors
- Graphics on color monitors
- Parallel printer interface
- Can support non-IBM monitors

Move up with these Special Enhanced Features:

- On card character RAM for custom definition of character set.
- Graphic modes are supported on IBM monochrome or color monitors.
- Up to 16 shades of green on monochrome monitors.
- 320 x 200—16 color graphics mode.
- 640 x 200—4 color graphics mode.
- 640 x 400—B/W graphics mode.
- A MYLEX software library on diskette supports enhanced features and is included.

Full emulation of IBM's display adapters, without modification or additional software.

MYLEX CORPORATION • 5217 N.W. 79th Avenue
Miami, Florida 33166 • 1-305-592-9669.
For more information call 1-800-446-9539 • In Florida
call 1-800-336-9539 • Dealer Inquiries invited.

*IBM is a registered trademark of International Business Machines Corp.

Managing Projects for ~~Fun~~ and Profit Using *optional required* Project Scheduler™



As a manager, you know the key to a successful project is good planning. Whether you are involved with Engineering, R & D, Manufacturing, Construction or even Computers, you can't afford to overlook critical costs and deadlines.

PROJECT SCHEDULER™ is a project management program designed to help management meet deadlines and beat cost targets through fast and easy project forecasting, scheduling, control and tracking of project status. The menu prompts permit easy data entry for modification or update to large, complex project plans. The highly interactive design and visual display reduces project planning time by providing sophisticated "what if" analysis capabilities.

Features include:

- Critical Path is calculated and a Gantt chart is displayed after each add, change or delete.
- Interactive "WHAT IF" analysis.
- Display your data/plots using the monochromatic or color screen.
- Schedule projects by days, weeks, months or day displayed by week.
- Labor & Other cost data can be input to spreadsheet packages.
- Allocate tasks by:
 - Start & duration
 - Early/Late Start
- Define standard company Resources and Holidays:
 - 24 Labor Grades
 - 24 Other Direct Costs
 - 30 Holidays (multi-year)

- Create detailed & summary reports:
 - Project Schedule
 - Labor & Cost
 - by time period
 - by individual job
- Ability to "complete" jobs for performance tracking.
- Milestone annotation to identify special events in the project.

Runs On:

- IBM PC or XT, Compatibles, TI, GRID, TOSHIBA, Others

Requires:

- IBM DOS 1.0-2.0 or MS DOS
- 192K RAM
- 1 diskette drive
- Printer (Recommended)



SCITOR

SCITOR CORPORATION

256 Gibraltar Dr. • Sunnyvale, CA 94086 (408) 730-0400

The Stock Portfolio System gets you out of the office and onto the golf course.

The Stock Portfolio System means more leisure time, less worry time.

Use the STOCK PORTFOLIO SYSTEM and your IBM PC or Apple II or III to track stocks, bonds, CD's, options, cash accounts and your other investments.

Also, tap into the Dow Jones News Retrieval service (optional).

The STOCK PORTFOLIO SYSTEM generates complete recordkeeping reports. Such as Current Portfolio Status, Profit and Loss Statements, Individual Security Status, Dividend Income, Interest Income/Expense reports. And more.

Use it to store quotes for historical recall. Or calculate your return on investment before and after tax.

The STOCK PORTFOLIO SYSTEM provides advance notice of stocks going long term, dividends coming due, options expiring.

Computer or

investment expertise is not necessary. A complete monitoring system at your fingertips.

See your dealer. Or send a check for \$185 + \$2 shipping (California residents add \$11.10).



**SMITH MICRO
SOFTWARE**

PO Box 604,
Sunset Beach, Ca. 90742
(213) 592-1032

IBM PC is a Trademark of International Business Machines
Apple Trademark of Apple Computers Inc.

Dow Jones News Retrieval is a registered Trademark of Dow Jones & Co., Inc.

CIRCLE 440 ON READER SERVICE CARD

ARE YOU DROWNING IN A SEA OF SOLUTIONS?

Recognize the symptoms?

Applications backlog? Technology blur?
Mounting user pressures?

You suspect that suppliers may have answers to your pressing problems, but you don't have enough time to sort through fragmented information to determine what will really work for you.

Like the shoemaker's kid who goes barefoot, you (of all people) need a system. An information system that displays all your current software, hardware and communications options for instant reference.

That system is DATA SOURCES, and you're invited to make it work for you. Simply fill in the coupon and we'll send you DATA SOURCES at 50% off its regular cover price.

What DATA SOURCES does is organize your options. It guarantees that you've considered all relevant products. And makes the most of your time for product evaluations by guiding you to those with the best possibility of success.

DATA SOURCES is a conveniently sized, extremely well-organized and skillfully indexed reference...maintained on a database, constantly updated and published quarterly.

YOU GET...

Hardware—Over 12,000 products from Micros to Mainframes including peripherals—terminals, printers, memory devices, etc.—organized by systems compatibility.

Software—The largest available inventory of business packages for micros, minis, and mainframes including operating systems, utilities, and application packages.

Communications Equipment—from modems and multiplexors to local networks, carriers and services. Quick reference comparison charts, plus all diagnostic and test equipment.

Services, Suppliers, Support—Most complete organized listing of suppliers from installation design to maintenance and data center operations.

READ WHAT USERS SAY...

"...Current and comprehensive listings are becoming indispensable."

Gary Yost
Marketing Services Director
ASK Computer Systems, Inc.

"Literally use it daily...dramatically shortens research time...provides more alternatives than would have been known or considered."

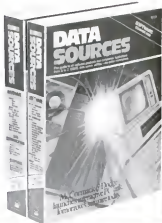
Curt Flatness, V.P.
Logic, Inc.

"Answer to a Systems Integrator's prayer...very effective for locating the equipment we need...using it for everything from single-user systems to systems interfacing with mainframes."

Richard Fletcher, President
Micro Computer Adaptation Procedure

"Dependable source of information otherwise unobtainable or costly to obtain..."

Barry Kukus, President
RSI Repair Service, Inc.



NEW FEATURES...

- ✓ Quick-reference product comparison charts.
- ✓ Market-tracking trends of new DP products.
- ✓ Before-you-buy selection criteria and checklist.
- ✓ Geographical listing of vendors offering on-site and depot maintenance.

ORDER NOW AND SAVE 50%

T 128

Yes! Rush me the latest two-volume edition of DATA SOURCES and enter my subscription at \$60.00 for 4 quarterly editions. I save a full 50% off the regular \$120.00 cover price.

Name

Title

Company

Address

City State Zip

Telephone

Nature of Company's Business

Please check appropriate box: ☐ END USER ☐ VAR/OEM ☐ DISTRIBUTOR

☐ DP MFG ☐ OTHER

An information product of Ziff-Davis Publishing Company. Satisfaction guaranteed.

Return coupon to:

DATA SOURCES **SAVE TIME...CALL DIRECT**
1-800-227-1617 Ext. 251
(In Ca., 1-800-772-3545 Ext. 251)
P.O. Box 5845, Cherry Hill, N.J. 08034.

Residents of Ca., Co., Ct., D.C., Fl., Ill., Me., Mo., N.J., N.Y., Vt., please add applicable state taxes.

CIRCLE 515 ON READER SERVICE CARD

COMPARE AT ANY PRICE

INTELLICOM (an INTELLigent COMMunications program)

INTELLICOM provides you with the capability of very intelligent computer to computer communications from both a terminal emulation and file transfer standpoint. INTELLICOM supports several file transfer protocols that facilitate the transfer of both binary and ASCII data and files. Since INTELLICOM is menu driven, it is a breeze to use and understand. IT IS USER FRIENDLY.

With INTELLICOM you will be able to communicate with the various data and timesharing services such as The Source and CompuServe. Additionally, since INTELLICOM supports the protocol used by virtually all remote CP/M systems around the world, all users can immediately begin to take advantage of the wealth of public domain software available on these systems. Current, or potential, users of CompuServe can transmit and receive both binary and ASCII data with full error detection and recovery. Printer operation is supported and can be easily toggled on and off by the user.

The checksum protocols allow for the verification of data blocks transferred (assuming appropriate support on the host end). This feature will be of great value in those applications where data integrity is paramount. INTELLICOM's documentation includes a detailed description of all protocols used along with machine readable examples of host pseudo code that will greatly ease the task of implementing support for INTELLICOM on any existing in-house mainframe (IBM, Dec, Wang).

Actual INTELLICOM menu is illustrated below:

- T - Terminal emulation
- U - Terminal emulation with data capture
- V - Toggle local echo (off)
- S - Cracksum protocol file transmission
- R - Checksum protocol file reception
- A - Ascii file transmission
- B - Ascii file transmission - PTR/PTP protocol
- C - Ascii file reception - PTR/PTP protocol
- O - Toggle local display (on)
- W - CompuServe Executive Terminal
- X - Intel Hex file transmission
- Y - Intel Hex file transmission - PTR/PTP protocol
- Z - Invoke OakFile function menu
- E - Exit program

INTELLICOM requires PC DOS one disk drive and either a modem or direct communication to another computer.

NOW ONLY \$49.95

COD add \$5.00 International orders add \$10.00

The Computer Toolbox Inc.
1325 E. Main St. • Waterbury, Ct. 06705
203-754-4197

CIRCLE 189 ON READER SERVICE CARD

NEW!
for
Intelligent Mail
Mailbox
Mailbox
Mailbox

The Full-Featured WORD PROCESSOR GOOD-WORDS™ with Space Saver Disk System™

- easy to learn and use
- full screen editing
- on-demand help screens
- function keys
- complete search/replace
- easy block moves: within a page, page to page, file to file, diskette to diskette
- on-line manual with index
- requires 128K min., 3 drives
- justification, centering
- easy cut/paste
- insert/delete characters, lines, pages
- simple file and disk commands
- space-saver-disk-system: 25% extra storage on every diskette
- back-up diskette included
- multiple printer support (incl. T.I. 810 LG)
- auto page numbering

FLASH

XI version available 11/83
order now - just \$149.95.

"Made in the shade."

only **99⁹⁵**

CREDIT CARD ORDERS: 24 hours Toll-Free 1-800-824-7888 (operator 685) Continental U.S., Virgin Islands, Puerto Rico

Alaska or Hawaii: 1-800-824-7919 (operator 685)

mail orders: oak tree computing, inc., 481 fairview ave., arcadia, ca. 91006

IBM and XI are trademarks of IBM Corporation. Good-Words and Space-Saver-Disk-System are trademarks of Oak Tree Computing, Inc. California residents add 6 1/2% sales tax.



CIRCLE 278 ON READER SERVICE CARD

Is DOS 2.0 a turkey or isn't it? Why did Peter Norton say such terrible things about the new operating system? Whose side are you on, anyway?

Mr. Norton, I Beg To Differ

After my initial week of exposure to DOS 2.0 on our new XT it was with mixed feelings of agreement, irritation, and amusement that I read Peter Norton's article on the new operating system's "darker" side (PC, "The Dark Side of PC-DOS 2.0," Volume 2 Number 2). That piece had the somewhat spoiled tone of someone complaining that his motorcycle won't fly to the moon.

I find it easy to fault programs too, and I would be remiss if I didn't admit to heaving my own sessions of fuming at the creators of the software I use, but my opinion of MS-PC-DOS 2.0 varies widely from the opinion of Mr. Norton. Allow me to take specific examples and offer my rebuttals to PC Magazine readers, potential 2.0 users, and Mr. Norton himself.

First of all, Mr. Norton says that there are "so many different kinds of problems that it is hard to categorize them in a simple way. Some of them are out end out bugs," and "there are so many problems with 2.0 that I don't think that IBM can sweep them under the rug." Not only do I find many of the errors and "bugs" men-

tioned in the article nonexistent in my 2.0, but his attitude seems to imply that the program is ill-written and unprofessional.

NORTON'S
article had the
*somewhat spoiled tone
of someone complaining
that his motorcycle
won't fly to the moon.*

ly, hastily executed.

I have disassembled all of the DOS, BIOS, and COMMAND.COM programs and spent some time enslyzing them and casually scanning the rest of the operating code, and I have a great deal of respect for the software engineering involved. I don't see any evidence of sloppy or unprofessional standards. When one considers that

the operating system consists of several thousand lines of source code, the few bugs of the nature I've seen (quite different than those reported), don't seem all that significant. I'm perfectly willing to allow IBM and Microsoft to release a product before every little nook and cranny of code has been verified. It is not operating the Space Shuttle, after all.

First of All . . .

Yes, there were oversights in the human interface, some glaring omissions, some problems with documentation (and yes, there are some bugs). On the other hand, there is a tremendous amount of easy to use, safe, and sophisticated code designed to ease the job of creating applications for the IBM XT. I admit that exploring some of the advanced functions sometimes takes a full night with assembler and debugger, but all complex software is like that. I suggest reading documentation from other manufacturers such as DEC and Digital Research before condemning Microsoft's attempt. I also suggest reading some literature on human fac-

tors in design: Everyone faces the same problems, but a few designers—Microsoft included—do a better job of solving them.

Some statements in the article led me to wonder if Mr. Norton had actually

SOME statements led me to wonder if Mr. Norton had actually spent much time with DOS 2.0.

spent much time with DOS 2.0 and read the documentation in depth. He states that the definition of the term ASCIIZ was obscurely hidden away in an appendix. Yes, it is tucked away in the appendix for applications and systems programmers—which would be required reading (in full) before attempting to utilize such a thing as an ASCIIZ string—but did Mr. Norton try to use any of the new DOS functions before reading the "Error Return Table" listing? That's the only way he would have missed the definition of ASCIIZ at the bottom of page D-14.

The documentation for using the extended ANSISYS keyboard-video driver and the escape-sequence codes is not very good or very complete, but Mr. Norton implies that it is some intractable mystery far beyond comprehension. So I suppose I get the "prize" he mentioned for not only figuring out the keyboard key-reassignment procedure, but also figuring out how to expand the amount of memory space allotted to stored strings by any chosen amount. It's not easy, but it can be done; you just have to do your homework.

I have yet to obtain the "odd" results mentioned when using the command. There is a substantial difference in effect between the /A and /B versions of the Copy command, and one switch stays in effect until another is detected, perhaps accounting for Mr. Norton's anomalies. I frequently need the Copy command to merge ASCII files, and everything came out perfectly.

The redirection of input and output is another victim of unjustified bad press.

While the feature is not as good as it could be (on any operating system I've seen), it does perform its stated function. Mr. Norton and PC contributing editor Mark Zachmann determined how they would like the redirection feature to work, then decided that it was "a distressing hug" because the documented behavior of the system didn't meet their expectations.

Yes, I agree that being able to use Ctrl-break on a process that's hung-up waiting for redirected input from an empty file would be nice. However, I don't call this a hug; I call it user error. I didn't expect "resourced" input to disconnect itself and cause the operating system to revert to console input. In any case, the documentation refers to this trait on page 10-5 in **boldface type**—although it's mistaken in saying that Ctrl-break will return you to DOS. I suspect that the line is supposed to read "You cannot return to the DOS prompt..." Anyway, it would be nice, but what did we all do before we could redirect input and output? This is a case of the ever-rising-expectation syndrome. I say: Learn to use the available software to full advantage before wishing it were different and then claiming it is incorrect.

In his article, Mr. Norton suggests that you might want to use the redirected input-output to answer questions like "Format another?" automatically from a file of responses instead of from the keyboard. Would someone please tell me who would redirect his confirmation inputs away from the keyboard when using the FORMAT command? Is this the appropriate use of the feature? Using redirected input to supply an unknown number of parameters is not how this is intended to be used. It would be better to patch the FORMAT utility.

On the other hand, if it is necessary to execute a complex set of operations repetitively from the keyboard under known and fixed conditions (such as inserting and deleting specific lines in EDLIN or generating disassembly and memory dump listings in DEBUG), then causing the commands to be read in from a text-file generated for that purpose works fine—as long as there is a termination of the command sequence back to a batch file that can reset the input function to the console. Mr. Norton may as well rail against the fact that if he programs a nonterminating loop in machine code, the computer won't let him recover by pressing Ctrl-break.

On the Contrary

"The Dark Side of PC-DOS" mentions "that an old bug from previous versions of PC-DOS still hasn't been fixed. Under the wrong circumstances, Debug can get hung up tracing a program, due to poor handling of the timer interrupt." I don't find the ROM timer-interrupt handler poor at all; the code increments the memory counters to keep track of the time of day, calls a user-defined interrupt, then clears the original request and returns. This is straightforward, not "poor." The complaint seems to be that a simultaneous timer interrupt and single-step interrupt (using the Debug T command) causes the timer request to remain pending while the single-step code executes. If the single-stepper then enters a state where it is waiting for keyboard input (after a single trace), the computer hangs up as it waits for the keyboard interrupt, which is blocked by the pending timer interrupt.

I wouldn't have believed this except for another article appearing in the August PC in which another reader voices the same complaint. I wish someone would tell me why I don't have this problem; maybe it's simply a question of luck. The probability of a timer interrupt occurring just as the T command routine executes the target instruction it intends to trace is about 1 in a million, assuming a 1 microsecond clock-pulse width and a random interval between T commands. If these odds still bother you, turn off the timer with an O 21 BD command (in DEBUG).

I DONT call this a bug; I call it user error.

After debugging and tracing hundreds of lines of code, both mine and other people's, I have yet to find a case of a Debug-crash where the fault wasn't my own. More likely causes of crashes could be:

- Tracing operating system code (dangerous, and not often successful)
- Setting breakpoints in the DEBUG program or the operating system (most likely fatal)



An IBM-PC Without FAST FACTS[™] is Like a Golfer Without His Bag.

Your IBM-PC is only half-ready for work if it doesn't have FAST FACTS, the executive's filing system. FAST FACTS, you see, makes full use of the IBM-PC's capability to handle information quickly and efficiently. No matter if you're a business executive or home executive, FAST FACTS can take care of your filing needs. And with its built-in Report Writer, FAST FACTS, makes it a snap to summarize selected portions of your files. What's more, FAST FACTS can share information

with VisiCalc®, 1-2-3[™] and WordStar®. It's also priced to fit easily in your computer budget.

So don't purchase an IBM-PC that's only half-ready for work. Get FAST FACTS, the latest introduction of Innovative Software, developers of proven executive businessware for the IBM-PC and its compatibles. Also ask your dealer about T.I.M. III, the user friendly data base manager and FAST GRAPHS, the full color business graphics package. Inno-

vative Software's products are available at Computerlands®, Computer Marts, Entre Computer CentersSM and other quality dealers. For more information call **1-800-255-0470**.

CIRCLE 272 ON READER SERVICE CARD

INNOVATIVE
Software

developers of practical businessware for the executive.

9300 W 110th St., Suite 380
Overland Park, KS 66210 USA
913/383-1049 • Telex 209542
1 800-255-0470

- Not noticing altered code or data segment register values, and then entering data using the A, E, OR L commands.
- Incorrect programs

I suppose that "under the wrong circumstances" people will make mistakes while using DEBUG. The same goes for airplanes and missiles.

The FIND and SORT utilities are maligned as "unpredictable," and Mr. Norton says that "SORT has been known to report that it is out of disk space..." This sounds like second-hand information to me. Check your sources.

I haven't yet caught the FIND command giving me things that weren't there, as claimed in the article, and the simplistic output formatting of the FIND command is about what one would expect. The usefulness of these utilities seems limited anyway, so I don't use them for database management and report generation. When I use them, however, I seem to be able to Find and Sort all my dir's (lower case in my COMMAND.COM), and any "You have a new message" messages on our inter-user memo system: No spurious data has ever surfaced. SORT also seemed to perform perfectly; it alphabetized an entire hard-disk PATH/F output (some 235 file names and 20 path names) with no errors (such as "out of disk space").

Compatibility vs. Efficiency

Much woe is expressed over the "sub-optimal" built-in to two of the DOS functions, which now operate differently than before. Mr. Norton was "appalled by what was done with 2.0." What was done to 2.0 was that an inefficient disk format was modified to be consistent with standard disk access algorithms. The result is half as much movement of the read/write head between tracks—not exactly sabotage, but an improvement, the fact of which Mr. Norton acknowledges. But Mr. Norton seems to feel that Microsoft somehow has a responsibility to ensure that all revisions end updates to its software maintain compatibility at the expense of good and efficient design. If Microsoft were bound by such constraints, it could not upgrade and improve its product.

I don't recall reading anywhere in the DOS licensing agreement that all software written under 1.1 was to remain 100 percent compatible with future upgrades. I was not led to believe that I was in a posi-

tion of "trusting" Microsoft to play by any rules. It is a programmer's responsibility to build in to his methodology a way in which changes and improvements can not only be integrated, but encouraged. Why

I HAVE yet to find a case of a Debug-crash where the fault wasn't my own.

would anyone expect Microsoft to play with the old inefficient cluster-numbering scheme? Yes, some software may have to be reassembled and recompiled, which is not too much trouble if the source code is written as it should be. For anyone who cares about access time and efficiency, the change is a boon. (The DOS calls recommended for absolute sector accesses are recommended because it is impossible to access sectors that are renumbered by various IBM software copy-protecting schemes through those calls. I can see no other reason.)

Of all things to lodge a complaint against, Mr. Norton decries that his Echo command is overridden by the batch file processor "if the last command in the batch file doesn't end with a carriage return." I would like to know why Mr. Norton chooses not to terminate the last command in his batch files with a carriage return. And why does he think it's Microsoft's responsibility to adjust the Echo command if he terminates a line with the END OF FILE marker. This is obviously intended to inform the operating system to turn the prompt on so that the user may know that the batch is finished. How does Mr. Norton propose that the system notify the operator that a batch file is done executing if it doesn't turn the prompt on? Would he rather be required to put an ECHO ON statement at the end of each batch file? Be my guest. What are "the bugs in ECHO" that "defeat much of its purpose"?

Mr. Norton's notion of command syntax is unique. "You should be able to use commas, spaces, or some other characters freely to separate the values for the para-

eters" when entering command lines. He might as well say that Pascal should accept commas, slashes, or whatever else anyone feels like typing as delimiters between identifiers and reserved words when scanning a line. Or perhaps BASIC should accept a statement like "FOR 1 TO 300 (STEP 5) ... PRINT: HELLO, I AM FINE, ARE YOU? NEXT." Is it that much trouble to press the space bar between parameters? This may bring up a point having to do with command languages as a whole, and fault-tolerance of typing errors, but I don't think that this implementation is at odds with currently accepted standards. When the scanner wants a blank, give it a blank; I don't see the problem.

Legitimate Gripes

Now, how about the important omissions and errors in 2.0 from my perspective?

- You can't define local or global symbols to the operating system, even though the SET command is provided. Wouldn't it be nice if you could say, "SET DATA=IMWRK", and then get a directory of those files by typing DIR DATA for the rest of the day?
- There are no built-in provisions for easily assigning and storing the key assignments you can make through the extended ANSI driver, and there is a serious bug in the code that loads the key assignments, which can cause the computer to hang.
- How about being able to ASSIGN PATH names, so that all disk accesses that an old 1.1 program reads as "access to DRIVE A:" are instead routed to C:\DIR1\DIR2\ETC ETC ETC?
- How about directing output to more than one channel at a time, like AUX and CON?
- How about a better text editor?
- How about a command to input responses such as the VMS ENQUIRE statement from the keyboard during batch file execution?
- How about a set of system-operator privileged commands to help facilitate a shared-resource management scheme?
- How about more flexibility in the "wonderful" hierarchical directory structure? Longer filenames?

To summarize, there is plenty that I would like to see in a personal computer operating system and plenty I would like to see fly out the window. In all fairness to

everyone, I would say to Mr. Norton that much is to be desired in the present implementation of all software, be it MS-DOS 2.0, CP/M, UCSD p-System, or disk-utilities packages.

WHY WOULD anyone expect Microsoft to stay with the old inefficient cluster-numbering scheme?

Everyone is in the dark ages of "user-friendliness," mostly because it takes a tremendous effort to get a computer to do anything. The state-of-the-art in home computers is such that we'll all be laughing in 20 years over DOS 2.0, CP/M, and the rest.

It takes shell upon shell upon shell to hide the intricacies of gates, bits, and bytes from someone who deals exclusively in market shares or bread recipes. An operating system is only one lower layer of a series of those shells.

DOS 2.0 is still what all operating systems have been to date: an application development environment, not intended for the general out-of-the-box-do-everything situation. As such, as an environment for developing software that nonprogrammers want, software that masks the inadequacies of computers (which programmers are paid to be able to deal with, exploit, and circumvent) from the users, it is the best bet going. Which is not to say that the game's not going to change. /PC

Gregg Weissman is director of software development and chief programmer for the New York firm of Village Information Company, Inc. He designs software for the IBM PC and XT. Before joining Village Information, Weissman wrote graphics software for Laserium.

For Peter Norton's discussion of the problems of technical criticism, see "The Norton Chronicles" in this issue.



\$69

Introduces*

AmeriSoft™

Edit Tool

Mainframe Power at Micro Prices

Simply the Most Powerful Editor for

Your Money

* List price \$175,
introductory price good until Jan. 1, 1984.
domestic available for \$6

Multi-Window / File

full screen editing

Data Editing

edit on either text or hex

Command Language

build new edit commands

User Defined Keys

each key can be assigned a sequence of editor commands

Undo / Redo

multiple editor changes

AmeriSoft™

(707) 778-8594 • (707) 762-0640

345 S. McDowell Blvd., Ste. 410

Petaluma, CA 94952

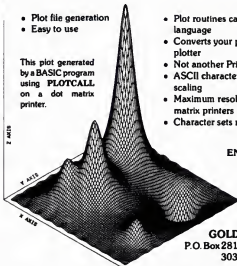


CIRCLE 106 ON READER SERVICE CARD

PLOTCALL GRAPHIC SOFTWARE FOR THE IBM PC

- Plot file generation
- Easy to use

This plot generated by a BASIC program using **PLOTCALL** on a dot matrix printer.



- Plot routines called from any language
- Converts your printer to a digital plotter
- Not another Print Screen program
- ASCII character set rotation & scaling
- Maximum resolution on most dot matrix printers
- Character sets may be altered

**ENTIRE PACKAGE
ONLY
\$149.00**

For further
information, ask
your dealer or contact

GOLDEN SOFTWARE
P.O. Box 281, Golden, CO 80402
303-279-1021

CIRCLE 295 ON READER SERVICE CARD

PC MAGAZINE 557 NOVEMBER 1983

DATABASE

Data Base Management System

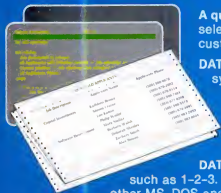
The Novice User to The Application Developer



Your business has unique information requirements. A personal computer can help. Acquiring the necessary "computerease", custom programming and continued support are luxuries you cannot afford. DATAEASE lets you use the full power of a computer to build your specific application. QUICKLY and SIMPLY.

Menus and function keys provide a uniform interface that simplifies and speeds the process of designing and using your system.

Create forms on the screen, define verification criteria and mathematical relationships. Your information is efficiently stored and readily accessible. As your needs change, modify your forms in the same easy manner. DATAEASE automatically revises your files while keeping your information intact.



A query language uniquely constructed through menu selection lets you access your many forms, generate custom reports, and EVEN update your files.

DATAEASE is the central component of an integrated system that serves your diverse needs.

With power comes flexibility. You can develop a solution to your individual needs. DATAEASE offers a continuously expanding wealth of customizable industry specific applications.

DATAEASE can readily interact with your application, such as 1-2-3. Available for use with IBM, VICTOR, DEC, TI and other MS-DOS and CPM / 86 machines.

Software Solutions, Inc.

305 Bic Drive Millford, CT 06460 • (203) 877-9268 or (800) 243-5123

Telex: 703972

Contact your dealer or call directly.

CIRCLE 415 ON READER SERVICE CARD

By following these step-by-step instructions, you can set up keys that will output longer strings of text when they are pressed.

Assigning Strings To Keys With PC-DOS 2.0

The manual for PC-DOS 2.0 mentions that you can assign any character string to any of the keys on the IBM PC's keyboard. You could create command lines and text that can be called up with single keystrokes from PC-DOS, just as can be done from BASIC. However, the manual is sketchy and obscure when it comes to actually explaining how to do this; it doesn't include step-by-step instructions.

After some experimentation I found a method that worked, which I will explain here. I also discovered that there is a limit to the total number of characters that can be assigned to the keyboard in this way—the computer will crash if you try to exceed this quota. The manuals don't mention these facts at all. If you're adventurous and somewhat familiar with DEBUG, you might follow my additional instructions to increase the maximum number of characters allowed while implementing a key-assignment scheme.

Directing the Device Driver

The portion of an operating system that controls input from the keyboard and output to the screen is called the *device driver* because it controls those devices. PC-DOS has been designed to allow you to easily replace those device drivers with

others. In the following case, the normal keyboard/screen input/output program (the Console device driver) will be replaced with the ANSISYS device driver. This extended program contains the logic for detecting and acting upon the special sequences of characters known as escape sequences, so-called because they all begin with ASCII code value 27 decimal, which stands for Escape, a term dating back to teletype days. The escape sequences translate into the key assignments you wish to make.

The first step is to get the ANSISYS program loaded into the computer by creating a configuration file called "CONFIG.SYS"; this will tell the operating system what to do with itself. If the statement "DEVICE=ANSISYS" appears in the CONFIG.SYS file, PC-DOS will load ANSISYS in place of the standard keyboard/screen console device driver. For more information on the DEVICE command and ANSISYS, refer to pages 9-7, 9-8, and Note 1 on page 13-2 in the PC-DOS 2.0 manual.

Changing the Device Driver

If you'd like to see this information in action, type in the following two lines to copy a CONFIG.SYS file to your disk:

```
COPY CON: C:\CONFIG.SYS
DEVICE=ANSI.SYS
```

(In the first line, "C:" is the label for the fixed hard disk. If you want to use a different disk drive, substitute the appropriate label.) After entering the second line, press F6 and then the Return key.

Now the extended console driver will be loaded from disk when the operating system starts. If this is the first time you have included the CONFIG.SYS file and the "DEVICE=ANSISYS" command, first reset the computer so that PC-DOS can load up the ANSI program—otherwise the examples in the article won't work.

The next thing that happens after the ANSISYS is loaded, is that PC-DOS 2.0 "calls" an initialization routine within the driver; PC-DOS asks the driver to set itself up (as it were) and return an address that is the last memory location the ANSISYS driver will occupy. PC-DOS needs to know how big the driver is, so it can utilize the memory above it for other functions. In its present, unmodified state, the ANSI driver returns an address that allows space for 200 of your defined character strings in addition to the program itself.

Once this initialization is complete, PC-DOS goes about its business, which normally has nothing to do with getting

special things to happen when keys are pressed. The next step is up to you.

Assigning Strings to Keys

The way that you assign a string to a key on the keyboard is simpler than it may appear in the PC-DOS 2.0 manual. All you need to do is to send a sequence of characters

to CON, which is the driver for the keyboard/screen console driver. Ultimately, this can be done either by sending the appropriate date to the CON device with the COPY command or by TYPEing the appropriate file. Either way, as long as the file contains the proper sequence of characters, the driver will interpret the file as

key assignments (the file can also provide screen controls, but that should be the subject of another article). Instead of having any text appear on the screen, as would normally happen when you TYPE a file to the console, the keys you specify in the file will be set up to return the string you assigned to them.

The form of the escape sequence that will cause the ANSYS driver to assign text to a key is also simple. The first character must be the Escape character, which has an ASCII value of 27 decimal. (This would be CHR\$(27) in BASIC; in hexadecimal, the value is 1B.) When the ANSYS driver sees you trying to print the character with a value of 27 decimal, it prepares itself to respond to subsequent characters not as characters to be printed to the screen, but as codes that you wish to be interpreted for you. The next character must be a left bracket, ([)—its ASCII value is 91 decimal or 5B hex. Once the driver has detected the Escape character, nothing will happen until it next detects the left bracket.

Up to this point, the driver has seen the Escape character and the left bracket ([), and is prepared to interpret the remainder of the command sequence either as

wabash[®]

DISKETTES

SSDD

\$1.62

48 TPI Soft

SSDD 1 92/19 20 box

SSDD 2 52/25 20 box

Smith-Corona[®]

TP-1[™] \$399

/16 20 box

5.25" DISKETTES

*While supplies last

Scotch • Memorex • Maxell Brand

48 TPI Soft Sector

SSDD 2.75/27.50 box

SSDD 3.50/35.00 box

Head Cleaning Kit \$18.95

Ultra Magnetics • Highest Quality

Bulk Pack • Lifetime Warranty

Without Labels or Envelopes

SSDD \$139.00/100 cs Soft Sector

SSDD \$149.00/100 cs Hub Ring

SSDD \$239.00/100 cs White Protect

WORD PROCESSING SOFTWARE

<p>Select[™]</p> <p>Word Processing System</p> <p>Learns in 60 minutes from your screen</p> <p>Includes \$315</p> <ul style="list-style-type: none"> • Teach • Merge • Spell 	<p>Micro Pro</p> <p>WordStar \$249</p> <p>Pro-Pack</p> <p>WordStar/MailMerge</p> <p>SpellStar/Star Index \$489</p>	<p>BRAND NEW!</p> <p>Starburst</p> <p>System Builder Tool \$119</p> <p>MailMerge 129.00</p> <p>SpellStar 129.00</p> <p>Star Index 109.00</p> <p>InfoStar 259.00</p> <p>ReportStar 175.00</p>
--	---	---

<p>Cables For IBM PC/XT — 6 ft.</p> <p>KEYBOARD EXTENSION 19.95</p> <p>MONOCHROME EXTENSION 29.95</p> <p>IBMPARALLEL PRINTER (EPSON) 22.95</p> <p>M/M RS232-C 9 pin 15.95</p> <p>M/F RS232-C 9 pin 15.95</p> <p>IBM/IDS 19.50</p> <p>IBM/NEC 16.35</p> <p>IBM/Hayes Smartmodem 15.80</p>	<p>Flip 'n' File</p> <p>5.25" 18.95</p> <p>DiskBank 5 pk 22.95</p> <p>Diskette Carousel</p> <p>Hold 72 Diskets</p> <p>• Stackable</p> <p>• 12" x 6" H</p> <p>• Precision Rotary</p> <p>• Colored Envelopes</p> <p>\$23.95</p>	<p>Lotus[™] 1-2-3</p> <p>\$355.00</p> <p>IBM Printer Ribbon</p> <p>(MX 40) 6.75</p> <p>(MX 100) 9.75</p>
---	---	---

A

SCII CODE

value 27 decimal stands for Escape, a term dating back to teletype days.

numeric values (represented by ASCII text digits) or as literal characters. In the first case, the driver interprets ASCII digits "0" thru "9," and calculates a binary value for the represented digits. If the driver is sent the ASCII value for 1, followed by the ASCII value for 9, the program calculates 19 decimal. If ASCII codes for 1, 2, and then 0 are sent, the resulting ASCII value is 120 decimal, and so on. The program continues to receive and calculate until it detects a semicolon character (ASCII value 3B hex), which serves to tell where one number leaves off and another one begins.

Up to this point, the command string

<p>U.S. Robotics Modem</p> <p>300/1200 Baud Modem</p> <p>Auto Answer Auto Dial</p> <p>Resistor \$345.00</p> <p>212A \$445.00</p>	<p>Taxan</p> <p>12" RGB Color Monitor</p> <p>RGB 14-Med Res \$265.00</p> <p>RGB 14-Hi Res \$295.00</p> <p>IBM Cable \$18.00</p> <p>Call on interface</p>	<p>Ritterman F/T</p> <p>120 CPS</p> <p>Like the FX-40</p> <p>Graphics</p> <p>Dot Matrix</p> <p>\$359.00</p>
---	---	---

<p>Epson</p> <p>FX80 395.00</p> <p>FX60 369.00</p> <p>MX100 655.00</p> <p>FX100 799.00</p>

How to order by mail: For prompt, courteous shipment, send money order, certified check, cashier's check, Mastercard/VISA (include card number, interbank number, expiration date and signature). Do Not Send Cash Re: C.O.D.'s. Personal and business checks must clear our bank before processing. Shipping and insurance charge is 4% of total order with a \$3.00 minimum charge. Michigan residents must add 4% sales tax. Truck shipments shipped freight collect. We ship to continental U.S., Alaska, Hawaii, Puerto Rico and Canada only. Outside continental U.S. add 6% fee. All merchandise is brand new, factory fresh and 100% guaranteed.

Prices subject to change. Advertised prices reflect 4% cash discount. Credit Cards 4% higher.

HRCOM

INTERNATIONAL

HRCOM International

24160 Haggerty Road • Farmington Hills, MI 48024

Telephone: 313/471-5840 Mail Order Only

CIRCLE 113 ON READER SERVICE CARD

COMPU SHACK

MAILING LIST: IF YOU ARE NOT A MEMBER OF THE LIST, PLEASE
 PRICES AND AVAILABILITY SUBJECT TO CHANGE WITHOUT NOTICE
 ALL RETURNED MERCHANDISE SUBJECT TO A 20% RESTOCKING FEE.

ADD 10% FOR NET TERMS

PRICES GOOD IN U.S. ONLY.

PRICES REFLECTED IN THIS

SECTION ARE LOWER THAN FRANCHISE STORES.



Special of the Month

IBM PC - COMPLETE LINE

IBM
 PC System includes 64K IBM-PC with two 320KB Floppy Disk Drives, Controller, Color Graphics Card, Monitor. All for only **\$2599.00**

LOTUS 1-2-3 SOFTWARE \$459

EAGLE II
 Computer System **\$1795**

TAVA PC
 Desk Top IBM PC Compatible Computer, runs DOS 2.0, DOS 1.1, and CP/M 86* **\$995**

AST RESEARCH
 IO Plus-Parallel & Serial Port, Clock Calendar W/Bat. back-up. Superdrive. Superspool **\$199.00**

Combo Plus—256K, Parallel & Serial Port, Clock Calendar W/Bat. back-up. Superdrive. Superspool **\$499.00**

Mega Plus—512K, Parallel & Serial Port, Clock Calendar W/Bat. back-up **\$999.00**

QUADRAM
 Quad Board - 256K, Parallel Port, Serial I/O Clock Calendar with battery backup **\$599.00**

512K Ram with Serial I/O **\$799.00**

HERCULES GRAPHICS CARD
 This card gives you 720x350 graphics **\$499.00**

BIG BLUE \$479.00

MAYNARD SANDSTAR SERIES
Multifunction Card \$95.00
 Floppy Disk Controller **\$225.00**
 Memory Card **\$189.00**
 Add-On Memory Module **\$99.00**
 Parallel Port Module **\$75.00**
 Serial Port Module **\$95.00**
 Clock Calendar Module **\$75.00**
 Games Adapter Module **\$59.00**

HARD DISK SYSTEMS FOR IBM AND APPLE

HARD DISK SYSTEM FOR IBM PC
 256K IBM PC, 360KB Disk Drive, FDC, 10 MB Hard Disk w/controller, Cabinet controller & software, Color Card, Monitor **\$3999.00**

MONITORS
AMDEK
 300A **\$199.00** I **\$349.00**
 300G **\$169.00** II **\$699.00**
 310A **\$199.00** III **\$399.00**
 IV **\$1199.00**

NEC
 JB 120IM **\$169.00** JC 1203 **\$755.00**
 JC 1212M **\$335.00** JB 1260 **\$139.00**

PRINCETON GRAPHICS SYSTEMS
 High Res. Color **CALL**



FLOPPY DISK DRIVES

SHUGART
 SA400 SS/DD **\$169.00**
 SA450 DS/DD **\$239.00**

TANDON
 TM-100-1 SS/DD **CALL**
 TM-100-2 DS/DD **CALL**
 TM-100-4 DS/DD **\$359.00**
 TM-848-1 SS/DD **\$425.00**
 TM-848-2 DS/DD **\$499.00**

SIEMENS
 FDD 100-5 **\$159.00**

DISK DRIVES
 For IBM PC
 Tandem 100-2 **CALL**
 Shugart SA-455 Slimline 320KB **\$250**

PRINTERS

DAISY WHEEL PRINTERS BY DIABLO

Model 620
 132 Column/20CPS **\$899.00**

Model 630
 API/40 CPS Letter Quality **\$1499.00**

Model 630
 ECS/40 CPS **\$1899.00**

Multi-Lingual **\$1899.00**

Daisywriter Daisywheel
 Printer **\$1175.00**

Epson FX-80 **CALL**

Epson FX-100 **CALL**

NEC

SPINWRITER **NEC**

7710-I **\$2095** 3510 **\$1495**

7715-I **\$2295** 3515 **\$1495**

7730-I **\$2095** 3530 **\$1495**

7720-I **\$2695** 3550 **\$1995**

7725-I **\$2695** PC8023A **\$ 595**

STAR MICRONICS

Gemini 10 **CALL**

Gemini 15 **CALL**

SMITH CORONA **APR**

TP-1 parallel **\$579.00**

TP-1 serial **\$579.00**

C-TOH

GX-100 (50 CPS Dot Matrix) **\$249.00**

8510 **\$469.00**

1550 (15") **\$699.00**

F-10 (40 CPS, Letter Qual.) **\$1395.00**

F-10 (55 CPS, Letter Qual.) **\$1695.00**

OKIDATA

82A **\$429.00**

83A **\$699.00**

84AP parallel **\$999.00**

84AS serial **\$1099.00**

92A **\$525.00**

93A **\$899.00**

IDS PRISM

Prism 132 (B & W) **\$1395.00**

Color **CALL**

BROTHER **brother** **\$769.00**

HR-I A parallel **\$869.00**

HR-I A serial **\$599.00**

DX-15 **\$135.00**

Tractor feed option **\$135.00**

SILVER REED **\$699.00**

Printer

APPLE IIe **apple**

Computer System Controller, Two Disk Drives, Monitor **\$1699**

OTHER PRODUCTS FOR APPLE

Special of the Month

\$199

TAVA CORP. DATA DRIVE

100% Compatible Disk drive for APPLE II+ and APPLE IIe. Runs DOS, CPM*, Pascal software.

SLIMLINE DRIVE \$269.00

TAVA PRODUCTS FOR APPLE

Cooling System and Power Monitor **\$59**

Joystick **\$49**

80 Column Card **\$149**

HAYES MICROCOMPUTER PRODUCTS

Micromodem II 300 baud **\$299.95**

Smartmodem 1200 baud **\$529.95**

PERSONAL ACCOUNTANT

Software for your Apple IIe and Apple II+ **\$199.00**

EPD PRODUCTS

Lemon Surge Protector **\$49.95**

Lime Surge Protector **\$79.95**

Peach Surge Protector **\$89.95**

Orange Surge Protector **\$129.95**

Plum Surge Protector **\$48.95**

COMPU SHACK

COMPU SHACK FRANCHISES AVAILABLE

WHERE ELSE CAN YOU FIND PRIVATE LABEL PRODUCTS NO ROYALTIES DISCOUNT PRICES FULL SERVICE & SUPPORT?

ONLY AT COMPU SHACK'S NEW FRANCHISE!

CIRCLE 362 ON READER SERVICE CARD

(714) 261-1000

FRANCHISE INQUIRIES WELCOME

16801 ARMSTRONG, IRVINE, CA 92716

HEADQUARTERS/TELEX: 915617 - ANSWER BACK: COMPU SHACK IRIN

*IBM is a registered trademark of IBM Corporation
 *APPLE is a registered trademark of Apple Computer, Inc.
 *CPM and CP/M are registered trademarks of Digital Research, Inc.

PRODUCTS AND PRICES NOT AVAILABLE AT ALL STORES

ALL FLOPPIES REPAIRED QUICKLY AT LOW COST

CALL FOR STORE LOCATION

looks like this: <Escape> [<ASCII digit> <optional ASCII digit> <optional ASCII digit> ;

In the "1,2,0" example above, the command would mean that you are telling the program to reassign the key that sends out the ASCII code 120 decimal when it is pressed. (If this matter still seems confusing, don't worry—it is confusing.) What is going on is that you are using ASCII codes for digits to represent the decimal value of another ASCII code that the keyboard sends out. If you were to look at the hexadecimal representation of the sequence so far, just as the ANSI driver receives them, it would look like this:

```
1B 5B 31 32 30 3B
<Escape> [ 1 2 0 ;
```

Now, if you send a single or double quote mark to the driver, it will store the next sequence of characters into memory as is, to be sent out later as a string of text whenever it detects key 120 decimal (which is lower-case "x").

Making a Key Assignment

Say you wish to have the computer spell out "EXAMINE" whenever you press lower-case "x." Your next command-sequence would then be: <ASCII quote-mark> EXAMINE <ASCII quote-mark>, followed by another semi-colon, then a lower-case p (p is the "Yes, I really meant that—now do it!" command to the driver program).

The following procedure demonstrates how you could assign a string to a key by using the DEBUG program. Assume the

same conditions as before; that is, you wish to have the computer type the word "EXAMINE" when you press the lower-case x key. You must use the DEBUG program at this point because you can't enter the Escape character from the keyboard. Under PC-DOS, the Escape key is inter-

WHEN YOU see the dash prompt (-), DEBUG is ready to use.

preted as "cancel the input line." A little later I will show a BASIC program that will automate all this, but for now, from PC-DOS, start the DEBUG program by typing DEBUG.

When you see the dash prompt (-), DEBUG is ready to use. Type this line as it appears, quotes and all. (The 22 that you type on either side of "EXAMINE" is the ASCII hex value for a double quote mark.)

```
E 100 1B '[120;'' 22
''EXAMINE'' 22 ''p''
```

Then press the Return key. What you did was to give the ENTER command (E), then the required sequence was entered directly into memory. Now type D 100 and press return. Look at the hexadecimal values on the first line at the left of the screen; they should look familiar:

1B 5B 31 32 30 3B

Now look to the right of the screen; you should see:

```
[ 120;''EXAMINE'';
```

Perhaps the result is a little clearer in this form.

Pressing the lower-case x key will return the ASCII value 120; that value is looked up by the console driver, and the associated string "EXAMINE" is printed out. Before this will work, however, you must write the little file you created onto the disk. To do so, type R CX and press Return. When you see the prompt, key in 10 and press Return; then type N KEYX.ANS and press Return to give the file the name KEYX.ANS. If you want to save the file on a different disk, type a drive designation before the file name; for example, you could key in N B: KEYX.ANS to assign the file to the B drive.

After naming the file, press the W key and then Return. The computer will respond with the message "Writing 10 bytes." When that process is over, press the Q key and then Return to exit from DEBUG. Check the disk directory to verify that the new file called KEYX.ANS is actually saved on the disk. Then type:

COPY KEYX.ANS CON:

and press Return. (If you had put KEYX.ANS on another drive, make sure to include the drive's name here.) When you do this, nothing should happen except

Figure 1: A BASIC program that prompts a user to assign strings to the ten function keys.

```
10 DEFINT I-Z:DEFSTR A-H
20 DIM ANSI.KEY(10)
30 FOR I=1 TO 10
40 ' 'KEY NUMBER ' ;I; ' STRING';:INPUT ANSI.KEY(I)
50 NEXT
60 REM This is an admittedly oversimplified input routine.
70 OPEN '0' , #1, 'KEYS.ANS'
80 FOR I=1 TO 10
90 ASKEY.CODE=MID$(STR$(58+I),2)
100 REM Line 90 strips off the leading blank from the string.
110 PRINT #1,CHR$(27) '[0;''ASKEY.CODE';''CHR$(34);ANSI.KEY(I);CHR$(34)''p'';
120 REM Note the trailing semicolon at the end of line 110.
130 NEXT
140 CLOSE
150 END
```

that the message "1 File(s) copied" and the PC-DOS prompt will appear.

Now type a lower-case x, and see what happens. If "EXAMINE" didn't appear on the screen, either the ANSLSYS console driver hadn't been installed (see the beginning of this article) or you keyed in something incorrectly. Try again after making sure the device driver is installed.

Automated Assignment with BASIC

What a laborious process that is! Who wants to go through all that each time you assign a word to one key? Not me—or you, probably. But here's a more effective solution: the entire keyboard could be defined by running a BASIC program that writes

the control codes to a sequential disk file, which you can then TYPE or COPY to the console driver. But before I present this BASIC program, another word on the ASCII values for keys is in order.

It would be nice if we could leave the standard key definitions as they are, and assign special character strings only to the function keys or Alt keys. The way to do this is to define the first number sent after the Escape and left bracket characters as ASCII value zero; this is followed by the semicolon, the actual "extended ASCII code" for the key desired, and finally the string assignment itself. A list of the function-key values can be found on page 3-14 of the Technical Reference Guide. You can use all the function keys in the standard, Shift, Ctrl, or Alt modes; actually 40 different codes can be assigned to the function keys. In addition, all the alphanumeric keys can be used in the Alt mode, including such keys as Home and End. However, as I mentioned before, this vast versatility is limited by the 200-character limit imposed by the unmodified ANSI driver.

Figure 1 is a simple BASIC program that could be used to let you go through the ten function keys, one at a time, and assign a different string to each one. When the BASIC program finishes and saves the KEYS.ANS file to disk, you can enter DOS, then type the file in order to effect the key assignments.

If you avoided the 200-character limit by being conservative with the length of strings you assigned to the function keys, you should now be able to return to DOS from BASIC by typing SYSTEM, then COPY the KEYS.ANS file to CON by entering:

COPY KEYS.ANS CON:

If the computer hangs up, well, thank Microsoft for the overflow glitch—don't blame me. Just reboot to start from scratch with PC-DOS and trim down your string dreams for now.

Figure 2 shows the key assignment program in use. If you succeed in assigning strings to your function keys, but get tired of that set of tricks, you can eliminate the key assignments by rebooting the system. You can also run the BASIC program in Figure 1 again to input blank "null strings" that deactivate the key assignments.

/PC

POWERTEXT. The Word Processing System For Professionals.



All across the nation, PowerText has become the prime word processing system for professionals.

Businesspeople. Writers. Attorneys. Educators. Men and women who demand a level of performance not available from the mass-market word processors.

If you require a true high-performance system, consider PowerText.

Formatting is fully automatic.

PowerText prints the most complex documents—from business letters to dramatic scripts to legal documents packed with footnotes—precisely consistent with the format you define. You need never worry about printed style as you write. Yet you always get perfectly formatted documents.

It's almost like dictating to your computer.

When you prepare outlines, questionnaires, and reports, PowerText can automatically indent and assign numbers to your paragraphs (Roman or Arabic numerals, or alphabets, as you direct.)

There's a full complement of editing features including "nested" editing, equivalent to split-screen editing.

You get built-in form letter capability.

Remarkably versatile columnar capabilities.

User-definable function keys
And far more.

Yet for all its power and sophistication, PowerText is remarkably easy to learn and operate. The system includes an excellent 10-lesson tutorial and a reference manual.

We'll send you complete details.

It is impossible to describe all of PowerText's many valuable features here. But we'll be pleased to send you detailed information, including many samples of actual PowerText output.

Just write us a note, or phone us. (Or you may wish to send for the tutorial and manual. The cost is \$25. Please indicate which computer you have.)

FOR IBM PC OR XT OR COMPAT: \$299
FOR APPLE II OR III: \$299
FOR IBM PC OR XT WITH PASCAL
APPLE II or III WITH PASCAL,
OR BASIC: \$199



BEAMAN PORTER, INC.
High Performance Computer Products

Pleasant Ridge Rd., Harnon, NY 10258
(914) 967-3504

CIRCLE 144 ON READER SERVICE CARD

Figure 2: A demonstration of using the program in Figure 1.

I wanted to be able to press any of the ten function keys and have the French word for its number appear on the screen. I ran the BASIC program in Figure 1 and keyed in the lower-case words in response to the prompt on each line.

```
KEY NUMBER 1 STRING? un
KEY NUMBER 2 STRING? deux
KEY NUMBER 3 STRING? trois
KEY NUMBER 4 STRING? quatre
KEY NUMBER 5 STRING? cinq
KEY NUMBER 6 STRING? six
KEY NUMBER 7 STRING? sept
KEY NUMBER 8 STRING? huit
KEY NUMBER 9 STRING? neuf
KEY NUMBER 10 STRING? dix
```

After entering the string for F10, I was returned to PC-DOS. I then saved the file of key assignments by entering the following after the prompt:

```
C>COPY KEYS.ANS CON:
```

The computer responded with "1 File(s) copied" and another prompt. Following this prompt, I pressed each of the function keys and the French names of the numbers appeared.

```
C>un deux trois quatre cinq six
sept huit neuf dix
```

When I pressed Return again, the screen read "Bad command or file name."

D\$COUNT

• BUSINESS SOFTWARE HARDWARE •
• for the IBM PC •
• NOW IN OUR 4TH YEAR •

ACCOUNTING SOFTWARE

	LIST COST
• CONTINENTAL HOME ACCOUNTANT + SBA General Ledger	150 88
• IUS Easy Business Sys. Q/L & R A/P (E)	295 240
• All three Packages Special	375 315
• S.W. DIMENSIONS ACCT. PLUS PC Q/L & R A/P (E) PAY 30-90 (E)	1495 960

COMMUNICATIONS SOFTWARE

• D.C. Hayes Smartcom II	119 75
• Microsoft Crosstalk XVI	195 115
• Southwestern Data Cadoures/PC	120 75

DATA BASE/FINANCIAL MODELING

• Applied Software Versatorm	389 240
• ASHTON-TATE FRIDAY! Ltd. Special	295 175
• Continental Utilites	195 115
• Eagle Money Decisions	199 127
• LOTUS 1-2-3 (Reg. 192K)	495 325
• Microsoft Multiplan	275 175
• Multi Tool Financial Smm	100 89
• Software Arts Tkl Solver	299 215
• Software Publishing PFS:File	140 87
• VisiCorp Visicalc 256K	250 180
• VisiCorp VisiPlot	300 200

MISC. SOFTWARE

• Comprehensive PC Tutor	80 52
• Continental FCM (Filing Cab/Mailer)	125 75
• Digital Research Concurrent CP/M 86	295 215
• CP/M 86	60 39
• BASIC 86	200 125
• Microsoft Flight Simulator	50 32
• PBI: Personal Investor (128K)	145 94
• Peter Norton Utilities 2.0	80 52
• Roadsoft Prokey	75 48

WORDPROCESSING SOFTWARE

• Computer SW Technology WordPC	80 47
• IUS Easy Writer II	350 225
• Microsoft Multi Tool Word w/Mouse	495 325
• SOFTWORD SYSTEMS MULTIMATE	299 215
• Sorcim Superwriter	195 125
• Spellguard	195 125
• VisiCorp Visiword	315 205

HARDWARE SPECIALS

• D.C. Hayes Smartmodem 1200	699 499
• Smartmodem 1200B	599 415
• Hercules Graphics Card	299 225
• Microsoft 64K System Card	365 255
• Practical Microflier II - In-Line/32K	229 200
• Quadram Microflier 32K In-Line/PAR	229 200
• Quad 512 + w/8K	325 220
• Quadcolor I	295 200
• Quadlink	650 485
• Quadboard w/8K	305 275
• STB SUPER 80 84K MULTIFUNCTION CD 2 RS-232, Parallel, Game Ports + Clock	475 319

dbASE II® SPECIALS

dbASE II (PC DOS) \$419 PLUS...

"dbASE II User Guide" by Adam Green

Now an easy way to learn this #1 Program!

List \$29 FREE w/dbASE II PURCHASE

• dbASE II UTILITY SOFTWARE +

• Fox & Geller Quickcode (Rgn. Generation)	295 75
• GGRAPH (w/fo Quickcode)	295 175
• dUTIL (Programming Aid)	95 58

• dbASE II PACKAGE SPECIALS +

• dbASE II + Quickcode	995 589
• dbASE II + Quickcode + dUTIL	1029 619
• dbASE II + Quickcode + GGRAPH	1290 730
• dbASE II + ALL Three dbASE II	1685 789

• dbASE II User Guide: 800-845-6620*

• CHANGE CARDS ONLY-MIN. \$200 800-845-6620*

• MON-FRI 10AM-4PM PACIFIC TIME

• CUSTOMER SERVICE-ORDER STATUS

• PRICE QUOTES/PRODUCT INFO

• 213-823-0767 (10AM - 4PM)*

TERMS: MAIL-ORDER ONLY Prices/Terms subject to change w/ notice. Some items limited supply. Mail Orders under \$100 - Add \$10. All Sales Final.

PAYMENT: Cashier's C/W/O/Bank Transfers/Personal checks. Allow up to 25 days-Cash Add 6% Tax (LA 6 1/2%). No C/O or Same C/W.O. only.

SHIPPING: Add 2% (min. \$6) UPS Surface. Postair/Foreign Add \$25 + Postage.

MASTERCARD/Visa: Add 3% AMEX: Add 5% (Min. \$200).

* IBM PC-TM of IBM Inc. • dbASE II-TM Ashton-Tate

PCW031PC10

• FREDERICK E. DEEG •
and Associates

13234-A FIJI WAY

MARINA DEL REY, CA 90292

Modifying the ANSI.SYS Console Driver

By making more ambitious use of DEBUG in PC-DOS 2.0, you can increase the PC's capacity for strings assigned to keys.

If you now understand how to assign strings to keys, and if you are familiar with the DEBUG program, you may want to take this next step—modifying the ANSI.SYS file to allow longer strings end more keys to be assigned. But beware: this can get tricky. If you're not comfortable with messing around in machine-language files, go very slowly. And, although this procedure seems to work okay on my version of PC-DOS 2.0, I can give you no guarantees.

The first thing to do if you undertake this project is to make a backup copy of the file called ANSI.SYS. To be on the safe side, you may want to modify this file on a separate diskette before modifying the hard disk's system files. It would be a funny feeling to have 2.5 megabytes of valuable data refuse to boot. Have the CONFIG.SYS file set up to load the ANSI.SYS file, as explained in the earlier procedure, by keying in these two lines:

```
COPY CON: C:\CONFIG.SYS  
DEVICE=ANSI.SYS
```

After entering these two lines, press F6 end then Return.

You should find it helpful to obtain a disassembly of the ANSI.SYS file from the debugger. To obtain the listing, press Ctrl-PrtSc, then call up DEBUG along with the name of the file by entering DEBUG ANSI.SYS. Then type U 1A2 750, press Return, and take a break until the disassembly prints out. It would be a good time to read the rest of the procedure. I assume you have the DOS 2.0 DEBUG program that allows you to assemble simple commands directly to memory—if you didn't have 2.0, I doubt you would be doing any of this.

Four changes have to be made to the program: 1) the initialization procedure has to return a higher ending address to

DOS upon completion of initialization; 2) the maximum value test for the total number of characters assigned to keys must be increased; 3) the initialization procedure must be actually moved to make the necessary room and pointed to within the device driver itself; and 4) a new end-of-buffer-value loaded into the CX register must be altered to conform with our changes.

The first step is to move the initialization code up by 300 hex bytes, using the "M" command. It might be a good idea to keep the Ctrl-PrtSc printing turned on to maintain a log of what you do here in case there are problems. You can refer to the printout later and check your work.

Look at the listing from 0709 to 074D. This is the initialization code that we will move. Type M 709 750 A09 and press Return.

You have just moved the code up 756 bytes, enough for many more keys to be assigned. But now we must compensate. Look on the screen to find the disassembly at 0A42. It reads:

```
MOV WORD PTR [BX+0E], 0609
```

This is the code that tells DOS that it can have back everything from 0609 hex on, relative to offset 0 in the segment where the device driver is loaded. The code you are seeing now has an offset of 100 hex added to it by the debugger. In DOS now, the code you moved from 0709 is actually located at offset 0609; this is precisely where the driver released its claim on memory. We have to add 300 hex to the value passed to DOS as well. You may use either the "A" command or the "E" command to change the value "0609" (not 0A09—remember the 100 byte offset from the debugger?).

To use the "A" command to assemble a new instruction, enter these two lines:

SCRIPT and GML on your PC!

ReadiWriter™

\$125⁰⁰ 30 Day
Money Back
Guarantee

- Free Full Screen Editor!
- Footnotes
- Lists (4 Kinds)
- Subscripts & Superscripts
- Proportional Spacing
- Index Creation
- Italics, Bold, Underline
- Macro Language
- Table of Contents
- 3 Fully Indexed Manuals
- Compatible with GML/SCRIPT

Mainframe power and compatibility and Micro usability in one package ReadiWriter (say "Ready Writer") is a superset of IBM's Generalized Markup Language on mainframes with major extensions plus support for over 50 Script commands.

The price would have been \$495 two years ago, the overwhelming success of the IBM PC makes such prices obsolete even for major software.

Requires 128K IBM PC with 2 drives

NEW! NEW! NEW! NEW! ReadiTerm™

Powerful communications package for 100 to 9600 baud, up/down load, auto-dial, command files, etc. Supports: Dow Jones, Source.

Automatic dial! Automatic log in!

ReadiWriter + Manuals \$125.00
Manuals + Demo Disk \$30.00
Mailing Labels and
Form Letters Option \$30.00
ReadiTerm \$75.00
ReadiTerm demo disk \$15.00
Shipping & Handling \$3.00

In CT add 7.5% tax
Visa, Mastercard, Check or MO

Full Credit for manuals/demos on purchase if bought within 60 days.

Call 203-431-3521 or Send your order now to:

ReadiWare Systems Inc.

Box 107A, Ridgefield, CT 06877

CIRCLE 387 ON READER SERVICE CARD

A 0A42
MOV WORD PTR [BX+0E], 0909

To use the "E" command, enter this line:

E 0A46 09

Either method has the same result. Next, look at the code on the screen at location 0A4A. It reads "JMP 04DE". Use the "A" command and change that by entering these two lines:

A 0A4A
JMP 01DE

This compensates for the jump forward of 300 hex bytes, as JMP instructions are calculated as an offset from the current instruction (more or less). That's why you effectively subtracted 300 from the JMP offset using the "A" command. (A good exercise would be to try using the "E" command to directly input the re-calculated offset that must be added to the location counter so that you land in the right spot.)

Does everything seem all right so far? Double check! One slipped bit is all it takes.

Next, just for cosmetics, fill the locations once used by the initialization routine (and any other garbage that was lying around in the computer in between the old and new initialization routines) with zeroes, so that the key-string buffer loads up empty. Use the "F" command by entering:

F 0709 0A00 00

Now use the "D" command to look at the "device driver header" up at offset 100. Start by keying in D100. (Look on the screen, as you didn't print out this portion.) Specifically, look at offset 0112. Two consecutive memory locations should read: "09 06". This was the offset from 0 of the initialization routine. Change the byte at 0113 to 09 by entering:

E 113 09

The offset is now that of the relocated initialization code. Remember that the offset will be 100 hex less than the offset you see in DEBUG.

You can increase the limit on the num-

ber of stored characters, now that there's room for them. Look at the code at 0630. It reads: "CMP BX, 00C8".

By using the "A" command again, you can enter a nice round figure like, say 02C0; this would raise the maximum number of allowed characters to 704. (I like to leave a lot of leeway here until the crash problem is solved, but theoretically you should be able to use all the memory from 541 to 0909—a total of 3C8 hex bytes, or 968 decimal.) To do this, enter these two lines:

A 630
CMP BX, 02C0

We're almost finished now. Look at the code at address 05FF. It reads "MOV CX, 0609". That number seems familiar, as it is the offset to the old initialization routine, and it appears at the end of the key-string buffer. You have to preserve the same offset relations with the other changes made, so change the code at 05FF to read "MOV CX, 0909" by entering these two lines:

A 05FF
MOV CX, 0909

The changes to code are now complete! One final step. We have to write the debugged file to disk, but the size of the file must be increased to take into account the expended buffer and relocated initialization code. Type R CX. The computer should respond with "CX 0680". You should now enter 990. Your ANSISYS file will now be 768 bytes larger. Enter W and the computer will respond with "writing 0980 bytes."

When this is finished, you will have vastly more potential to assign strings to the keyboard. The ANSISYS file will load when you reset the computer, and you can then test your work. If anything weird happens that didn't happen before you made these changes, double and triple check your modifications. Start from the beginning if necessary. Though the effort may seem great now, afterwards you can let the computer do some of your typing once you've assigned strings to keys to your heart's content. Theoretically, there should be no limit to the storage space you can add to the key buffer, using this technique. —G.W.



Sometimes the best things in life are the least expensive.

The FMS-80 relational DBMS is one of the most powerful database management systems you can buy for your Micro or PC. Some say it's the best. And now that we've reduced its price from \$995 to just \$395, it's the best software value in the world, bar none! An unbeatable combination of price and performance.

FMS-80 has features *now* that no other DBMS can match. It is the only multiuser system in its class with true record lock for MP/M II, MmmOST, and TurboDOS operating systems. It has a responsive on-line help system and is 100% menu-driven, so you can move around inside with ease and confidence. A very simple "screenwriter" program lets you design data entry screens with a word processor. It even generates custom-made reports without programmer language. And it has a clear tutorial manual so there's no formal training required to get started.

And yet FMS-80 is the computer professional's dream. It has a shell that can run any CP/M-compatible software from the system command line and from custom menus. It has a development language that accesses up to 19 open files at once, performs random and sequential keyed read and writes, and supports full string handling operations for complex business, financial and scientific applications. The flexibility and power of this system are simply astounding!

We're so confident one of the 10 best selling DBMS's in the world will soon be the best seller, we're offering a 30-day money-back guarantee on the FMS-80 System. Not just a demo, or a self-destruct disk, but the *whole thing*, including seven application programs!

After all, who's going to send back the best deal since penny candy?



FMS-80

The Affordable Relational Database Management System.

djr

Distributors: New York (212) 679-6180. (914) 762-5644. • New England (617) 461-4010. • Mid-Atlantic (703) 379-0195.
 • Midwest, Mountain & Plains States (712) 255-4362. • West (415) 965-8000. • South (214) 445-1312. • Other areas (914) 631-6766.
 International: Canada (416) 821-3311. • Great Britain 44 962 69344 or 274 309386. • France 33 1 5546264. • Greece 30 1 958.9862.
 • Israel 972 03-28-676. • South Africa 27 11 377-423. • Australia 61 2 922-3677. • Singapore 65 746-2483. • Philippines 63 2 817-4318.
 • Hong Kong 852 3-857091. Priced slightly higher internationally.

If you have a DECmate II, DEC Rainbow, IBM PC or Victor 9000 microcomputer, call today. Available for use with CP/M, MP/M II, MmmOST, TurboDOS, CP/M-86 or MS-DOS operating systems. Visa and MasterCard honored.

CIRCLE 609 ON READER SERVICE CARD

Software developed by the Systems Division of Physical Sciences Inc. allows engineers to perform systems analysis on microcomputers.

PC Engineering Applications

PSI/Systems Engineering Software
Physical Sciences Inc./Systems
Division
P.O. Box 3100
Andover, MA 01810
(617) 475-9030

List Price: S3EPAK, \$50; THERMOPAK, \$100; MATHPAK, \$75; FLUIDPAK, \$225; HXPAK, \$275; REACPAK, \$325; FCPAK, \$375; PDROP, \$75.

Requires: 128K RAM, one disk drive, (color/graphics adapter recommended).

CIRCLE 620 ON READER SERVICE CARD

Every PC owner knows that contained within the system's unpretentious hardware is the potential for diminishing the drudgery of work while greatly increasing productivity. The realization that personal computers can do serious work at relatively low cost is probably the major driving force in the current microcomputer boom. Many individuals and companies buy PCs for specific applications. While

they are aware that the PC can be quite versatile, they often are uncertain about how to use the computer for applications other than word processing, electronic spreadsheets, and accounting.

The engineering software developed by the Systems Division of Physical Sciences Inc. indicates the range of possible applications for the PC. Supported for the TRS-80 Models I and III, the software is touted as the only powerplant and chemical process flowsheet analyzer that operates on microcomputers. These programs are written in BASIC and demonstrate the power of the language as well as some of its limitations.

Engineering Tools

PSI/Systems engineering software can be viewed as a set of tools for the working engineer to use in the analysis of thermodynamic systems such as power plants. These tools are in the form of subroutines, which PSI/Systems calls "modules," and are functionally grouped into packages, or

"PAKs." The complete library of engineering software consists of eight PAKs: S3EPAK, for systems analysis; THERMOPAK, for analysis of the thermodynamic properties of gasses and liquids; MATHPAK, for developing curve-fitting routines, simultaneous linear equations, and other applications; FLUIDPAK, for applications involving compressors, turbines, etc.; HXPAK, for heat exchangers, boilers, and condensers; REACPAK, for reformers, gasifiers, etc.; FCPAK, for phosphoric acid, molten carbonate, and alkaline fuel cells; and PDROP, for pressure drop of gasses, liquids, or in circular tubing. This review is limited to the S3EPAK, THERMOPAK, MATHPAK, FLUIDPAK, and PDROP.

The PAKs may be purchased separately or in various combinations. The S3EPAK is the core of the software line. (S3E stands for State Systems Engineering.) Most applications will use the S3EPAK, which includes a tutorial, in combination with one or more of the other

reflect changes or additions. Unfortunately, the INDEX module uses sequential access and prints each entry to the screen during its search. This process is slow and can be irritating. The first time that I used it, I thought that the program was malfunctioning.

PSI/Systems should rewrite the INDEX module using random access and an efficient search methodology so that it will live up to its potential usefulness.

A sample program for a simple turbine system is provided to demonstrate modeling procedures (see Figure 1). The user types in the main program example in Listing 1 and is instructed to merge the appropriate modules to produce a complete program. Here, the instructions are simply inadequate and contain both inaccuracies and omissions. The instructions called for COMP2, TURB2, and BURN3 modules, but the diskette supplied by PSI/Systems had COMP, TURB, and BURN2 modules. The instructions also called for the LPRNT module, which didn't exist on my distribution disk. What it did have was a module called LPRNT2 for the IBM dot matrix printer and LPRNT3 for use with a daisywheel printer. Omitted from the list of modules to merge were the EQUATE2 and MIX2 modules, which are necessary for the program to run. One of the modules also required a little editing before everything would run properly.

After some experimentation and a phone call to PSI, I had the example program up and running. PSI's response to

my call was friendly and helpful, but the instructions given for this sample systems analysis tutorial do need more work. Figure 2 shows the work performed by the sample system and Figure 3 describes the conditions at each node of the system. The nodes represent points in the system, which are at a steady state and for which thermodynamic values may be readily calculated.

Figure 2: The sample program output shows work performed in the system.

```
COMPRESSOR WORK = 138.212 KW
TURBINE WORK = 242.367 KW
NET WORK = 104.155 KW
```

Utility Programs

In addition to the operational modules, which are integrated into larger programs within the S3E environment, a number of utility programs for solving limited mathematical problems are included in MATHPAK and S3EPAK. These utilities are stand-alone programs useful in systems analysis programming; they are not intended to be incorporated into other programs. The curve-fitting routine included in MATHPAK, for example, is a utility designed to allow the user to find a polynomial function of the form

$$y = f(x) = a + bx + cx^2 + dx^3 + ex^n \dots$$

where a, b, c, d, and e are constants.

This polynomial approximates a curve described by the user's datapoints; it allows the user to approximate an arbitrary curve with a specific function.

Conclusions

The value of a product such as PSI/Systems Engineering Software is directly proportional to its ease of use. This product gets passing marks in the easy-to-use department, but there is room for improvement. The INDEX module is painfully slow, and the programs in general suffer from the slowness of BASIC. While BASIC has the advantages of its interactive nature, its small memory requirements, and its widespread use, the language is slow and not well-suited to writing and maintaining large programs. Because of its modularity and potential for analyzing large systems, PSI/Systems' engineering software is better suited for languages such as Ada, C, and Modula 2.

In addition to the PC, the software should work with PC compatibles that have the BASICA interpreter from Microsoft. It ran on my Dynalogue Hyperion, as well as on the IBM PC. The product is best suited for practicing engineers, but it also could be useful in junior-level engineering courses in systems analysis. PSI/Systems has some revisions on the way, but even in its present form, this line of engineering software is a worthwhile investment. Overall, PSI/Systems has developed a valuable engineering application for the PC.

/PC

Figure 3: PSI/S3E Node Array shows flow rates throughout the system at each point, or node, and gives a picture of the steady state status of the system.

NODE	1	2	3	4	5	6
H2	0.000	0.000	0.000	0.000	0.000	0.000
H2O	0.000	0.000	0.000	0.000	6.525	6.525
CH4	0.000	0.000	0.000	0.000	0.000	0.000
CO	0.000	0.000	0.000	0.000	0.000	0.000
CO2	0.000	0.000	0.000	0.000	7.250	7.250
O2	50.000	50.000	0.000	50.000	39.488	39.488
N2	188.665	188.665	0.000	188.665	188.665	188.665
FUEL	0.000	0.000	1.000	1.000	0.000	0.000
TOT	238.665	238.665	1.000	239.665	241.928	241.928
PRESS	1.000	3.500	3.500	3.500	3.500	1.000
ATM						
TEMP	70	352	70	345	1345	914
Deg-F						
ENTHALPY						
BTU/hr	8.7871E+05	1.3504E+06	-3.8896E+04	1.3248E+06	1.3250E+06	4.9782E+05

FOCUS ON YOUR PRODUCTIVITY

WHAT IS YOUR TIME WORTH?

TED™ . . . TRACE86™ . . . and COPY PROTECTOR™
will increase your productivity for a small investment.



TED™ - PROGRAM TEXT EDITOR

**SYSTEMS
DEVELOPMENT
SERIES FOR
THE IBM™ PC.**



TRACE86™ - PROGRAM FILE UTILITY

TED™ . . . THE PROGRAMMER'S FULL SCREEN TEXT EDITOR

- **Instantaneous** response to commands—file resides in RAM (up to 7000 lines).
- **Go directly** to any line in your file or scroll. Logical line numbers generated for editing can be toggled off if desired. Print text with or without line numbers.
- **Merge** files or sections of files.
- **Manipulation features:** move . . . copy . . . locate . . . merge . . . delete lines and blocks, plus search & replace (works like SPF).
- **EASY REFERENCE™**, toggle between current and reference screen.
- **Automatically** update time, date, and version number in text (optional) when saving file.
- **Assign** up to 75 characters to any function key.
- **Use** on any ASCII file (Source Code or Data).

TED™ requires 128K RAM and is written in Assembler.

\$95.00

TRACE86™ . . . VIEW THE OPERATION OF THE PC . . . AS YOUR PROGRAM RUNS!

- **Run .EXE or .COM** programs at slow speed while memory contents, the 8088 register values, and each instruction (in Assembler) are displayed on the screen . . . **ALL** simultaneously! **STOP** at any point, examine file or memory, make changes and continue at slow speed or single step.
- **Designate** proven subroutines as "fast" to avoid a slow TRACE of that particular subroutine.
- **Set breakpoints** at any place in program.
- **Unassemble** any part of memory or file, and write results to screen or disk.
- **Search, examine, and change** any portion of memory.
- **Examine** any disk file or designated sector, make modifications and write back out to the disk. Copy files to any place in memory, or any block of memory to a file.
- **Compare** blocks of memory.
- **Display** and examine the 8087 registers.

TRACE86™ requires 128K RAM and is written in Assembler.

\$125.00

COPY PROTECTOR™ . . . FREE WITH THE PURCHASE OF TED™ AND TRACE86™ Protect your program from unauthorized duplication. **COPY PROTECTOR™** requires 64K RAM and is written in Assembler. \$95.00 Good until 10/31/83

Demo disk package \$5.00.



Dealer inquiries invited.

Morgan Computing Company . . . distributor for
DYNAMIC MICROPROCESSOR ASSOCIATES, INC.
EM80/86™ Emulator, 8086 O.S. Converter,™ Formula II™
and Ascom.™

Morgan Computing Company
10400 N. Central Expwy., Suite 210
Dallas, TX 75231
(214) 739-5895

CIRCLE 599 ON READER SERVICE CARD

Report Manager, which performs standard spreadsheet functions as well as some fancier ones, deserves to survive in a market crowded with visiclones.

Report Manager: Not Just Another Visiclone

Report Manager, Version 1.06A/E
Datamension Corporation
615 Academy Dr.
Northbrook, IL 60062
(312) 564-5060

List Price: \$399

Requires: 128K RAM, two floppy disk drives or one hard disk, printer.

CIRCLE 694 ON READER SERVICE CARD

The fight for market share in the spreadsheet niche is one of the fiercest in the whole micro software industry. Any new product that has to battle it out with VisiCalc, SuperCalc, Multiplan, and 1-2-3 had better be good. In this market, matching the leaders is not enough; any newcomer has to stand out just to survive.

Report Manager (RM), published by Datamension, deserves to survive. Though it does have a few unfortunate eccentricities, RM is a spreadsheet that not only performs the standard functions as

well as anyone could wish, but comes with a few original features that set it apart from the mass of visiclones. The most notable of these are a three-dimensional, page-oriented workspace and a built-in programming language, which allows the user to set up interactive data-entry files.

Standard Functions

To begin with the standard functions, the basic RM spreadsheet is a matrix of data cells with as many as 255 columns and rows. Individual columns may vary in width, and numeric data cells can be formatted—either globally or individually—for integer, decimal, or scientific notation. Numeric cells may contain just about any mathematical, trigonometric, statistical, or logical operator you can think of and can contain up to 127 characters of user-defined formulas.

Within a formula, a data cell is identified by its coordinates: column letter and

row number. Cells that are referred to frequently can be given names up to eight characters long, which make the cells much easier to remember. Thus, if a profit figure is the subject of many calculations, the cell in which it is contained can be named "profits," and formulas can include the name rather than the coordinates.

Like all good spreadsheets, RM has a replication function, whereby format, contents, formulas, or all three can be transferred to any cell or series of cells within the workspace. For instance, if the job of one numeric cell is to find the standard deviation of a series of data cells two columns to the left, that same formula and spatial relationship can be transferred anywhere on the spreadsheet with a few keystrokes. Whole columns and spreadsheets can be replicated with the same procedure.

This makes it easy to create complex

forecasting models, which redo all subsequent calculations whenever new data is entered. Waiting for RM to do all the math is time-consuming, so, in cases where you have several new values to enter in a complex spreadsheet, it allows you to turn off the automatic recalculation feature and

A BUILT-IN
calendar can tell you
how many days apart
June 23 and November
19 are, and on what day
of the week they fall.

enter the data. Once you've entered the data, turn on the auto-recalc feature, and RM will produce the new results.

The program has a built-in calendar that allows it to do duration calculations; it can tell you how many days apart June 23 and November 19 are, and on what day of the week they fall. Curiously, its date entry format requires that the year portion be entered in four digits. To RM, 6/23/83 is a date in the year 83 A.D., making it the easy winner in the archeological spreadsheet market.

Since RM workspace can be far larger than your PC's display screen, the program allows you to look at several parts at once. The screen can be split in half, vertically or horizontally, or into equal quarters. Data can be entered and manipulated in any of these windows.

Another way to temporarily shrink the workspace is to "freeze" a few columns or rows, or both. If, for example, you are working on a report that is 200 columns wide and you would like to compare the first column with the 55th, you can freeze the first column onto the screen and move the cursor to the 55th. This way, instead of rolling off the screen to the left, the first column—and only the first column—will stay put, and any other column can be brought next to it. It's as if you had taken a tuck in your spreadsheet.

RM runs in color or monochrome but does not have true graphics capability. It can produce bar charts by stacking graphics characters on top of each other, but

Figure 1: A graphic representation of a rudimentary data cube.

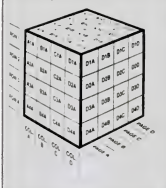


Figure 2: The data cube after it has been split along column B.

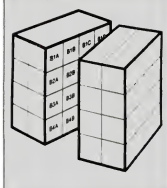


Figure 4: By splitting the data cube at the third quarter column, you can compare third quarter results for each year.

1983	1984	1985	1986
3rd Q	3rd Q	3rd Q	3rd Q
1102	1340	1629	1980
1213	1474	1792	2178
1433	1742	2118	2574
3748	4556	5538	6732
276	335	407	495
1654	2010	2443	2970
662	804	977	1188
2591	3149	3828	4653
1158	1407	1710	2079
463	563	684	832
694	844	1026	1247

nothing fancier. Interestingly, RM is one of those rare programs that allow you to access the full IBM character set via the standard Alt key/number pad sequence. This way you could draw pretty borders, write labels in Spanish, or build bar charts out of musical notes. But unfortunately, all this prettiness would turn into garbage on most printers.

There are no tricks to printing a RM spreadsheet. You can print by screenful or by any number of columns and rows you choose. RM was thoughtfully designed, allowing you to specify a printer initialization string from the keyboard. This way, you can access every font in your

printer without any kind of installation procedure. You want your report in compressed italics? Provided your printer has this capability, you just send it the control code from within the program.

The Data Cube

All these features are fine and good, but what Datamension hopes will be RM's big attraction is its three-dimensional approach, which the manual calls "the data cube." In effect, every RM spreadsheet is just the first page of a series of up to 255 similar spreadsheets. You can envision the data cube as pages lying on top of one another, just like a stack of paper on a

Figure 3: A printout of one page from a four-page RM data cube, which shows quarterly sales and profit projections for 1983.

		1983	1983	1983	1983
SALES		1st Q	2nd Q	3rd Q	4th Q
Guns	\$	1000	1050	1102	1158
Butter		1100	1155	1213	1273
Margarine		1300	1365	1433	1505
TOT. SALES	\$	3400	3570	3748	3936
EXPENSES					
Graft	\$	250	262	276	289
Salaries		1500	1575	1654	1736
Rent		600	630	662	694
TOT. EXP	\$	2350	2468	2591	2720
Pretax Inc.		1050	1102	1158	1216
Taxes		420	441	463	486
NET INC.	\$	630	662	694	729

Figure 5: A new first page, containing only labels, is added to the data cube.

SALES	SALES	SALES	SALES
Guns	Guns	Guns	Guns
Butter	Butter	Butter	Butter
Margarine	Margarine	Margarine	Margarine
TOT. SALES	TOT. SALES	TOT. SALES	TOT. SALES
EXPENSES	EXPENSES	EXPENSES	EXPENSES
Graft	Graft	Graft	Graft
Salaries	Salaries	Salaries	Salaries
Rent	Rent	Rent	Rent
TOT. EXP	TOT. EXP	TOT. EXP	TOT. EXP
Pretax Inc.	Pretax Inc.	Pretax Inc.	Pretax Inc.
Taxes	Taxes	Taxes	Taxes
NET INC.	NET INC.	NET INC.	NET INC.

desk. Thus, each data cell actually has three coordinates: row, column, and page.

Figure 1 is a graphic representation of a rudimentary data cube, four columns by four rows by four pages. The user moves deeper into the data cube (from page A to page B) by hitting the PgDn key and moves back out with the PgUp key. What makes the data cube concept more than just an added convenience is that RM allows you to link pages to one another by cell reference. A formula on one page of the data cube can refer to cells on other pages, so long as the page coordinate is included in the cell reference. Whole pages can be rep-

licated with a few keystrokes, and a change on one page will result in immediate recalculations on all related pages.

Even more impressive is a feature that allows you to split the data cube along any row or column and rotate the newly created surface into view. Figure 2 shows the data cube after it has been split along column B. The newly created surface is made up of every column B on every page in the data cube. For instance, Figure 3 is a printout of a page from a four-page RM data cube, showing quarterly sales and profit projections for 1983. There are three more projections on the remaining three pages, one each for '84, '85, and '86—all repli-

cated from the first page. If you cut the cube along the third quarter column, you should be able to see and compare third quarter results for each year (see Figure 4). However, since you are looking straight into the cube along a column of numbers, numbers are all you see. The labels are over in the first column of each page. This problem can't be solved by chopping open the data cube along the labels column, since, in this case, all you'd see would be labels—pretty useless without numbers.

The solution is to add a new first page to the data cube (see Figure 5), which contains only labels. This bizarre-looking screen is a replica of what you would have seen if you had split the original data cube along the first column. Now, however, when you split the cube along the third quarter column, you get not only the numerical data but labels as well.

The result (see Figure 6) is printed with the standard RM coordinate grid. Now, what appears as columns A through E actually represents pages from the original cube. Page A, which had nothing but labels on it, is now column A; page B, with 1982 projections, is column B, and so forth. Pressing the PgDn key will now take you sideways through the cube to fourth quarter projections, and the PgUp key to a comparison of second quarters. By designing the data cube to accommodate this kind of manipulation, you can create entirely new reports from the same data by

YOU COULD
draw pretty borders,
write labels in Spanish,
or build bar charts out
of musical notes.

simply splitting the cube—a powerful, sophisticated procedure, which is yours for only three keystrokes.

Nevertheless, the cube concept is useful only with pages of related data that are identically formatted. Furthermore, it can take a lot of tinkering to get a cube formatted correctly; labels have to be positioned carefully, and they work best when all the columns in a report are the same width.

VISUAL

```
cursor(left = noaction) +
cursor(up   = noaction) +
           = noaction)
```

(DOS COMMANDS)

```
t = fly
= fly
= fly
= fly
```

```
u
dd
```

```
ddle
```

Visual

DOS COMMANDS

List files on a

List files on b

Display window dir

Debug

BASIC

Edit a file

Copy file

Type file

```
Copy block = button(middle = a-b) button(right)
Overlay block = button(middle = a-b) button(right)
Delete block = a-u button(middle = a-b) button(right)
Print block = button(middle = a-b) button(right)
Move line = button(middle = a-i) button(right)
```

COMPLICATED COMMANDS ARE HISTORY!

Visual Shell for the IBM Personal Computer

Visual makes your computer work the way you do—in a highly visual environment. All the information you need to do a job can be viewed through windows on your screen.

You do not need to remember any complicated commands. Now you can select actions and objects by pointing and clicking mouse buttons.

All your software becomes friendly and visual without any modification.

FEATURES

1. Verb and object selection by pointing.
2. User defined Visual environments.
3. Up to 48 windows.
4. Works with all IBM PC and PC/XT software (DOS 1.1 & 2.0).
5. Mouse works on any surface.
6. Most popular mice are supported.
7. Mouse is not required but is recommended.
8. No mouse interface card is required.
9. Works with monochrome and color displays.
10. Hard (fixed) disk is not required.
11. Works with 64k memory.
12. Complete package, nothing else to buy.

Order Visual through your local computer store,
mail the coupon or call...
(408) 374-5001

Visual is a registered trademark of Trillian Computer. LogiMouse is a registered trademark of LogiTech Inc.
IBM-PC is a registered trademark of IBM Corp.



trillian™

Computer

P.O. Box 481
Los Gatos, CA 95031

CIRCLE 491 ON READER SERVICE CARD

- ☐ Yes! I want Trillian Visual. \$299 (Without mouse. Mouse not required but recommended.)
- ☐ Visual with LogiMouse 1 \$485
- ☐ Visual with LogiMouse 2 \$495 (Available in November 1983)

California residents please add 6% sales tax.

Please send check or money order payable to:
Trillian Computer Corp., P.O. Box 481, Los Gatos, CA 95031

Mr./Mrs./Ms. _____ (please print full name)

Address _____

City _____ State _____ Zip _____

Phone () _____

☐ Check or money order enclosed (U.S. Currency)

☐ MasterCard/VISA No. _____

Expiration Date _____ Bank No. (if MC) _____

Signature _____

Figure 6: The result of adding the new first page to the data cube. Now the numeric data is labeled in the printout.

C	A	B	C	D	E
0015	1983	1984	1985	1986	
0025					
0035	SALES	3rd Q	3rd Q	3rd Q	3rd Q
0045					
0055	Guns	1102	1340	1629	1980
0065	Butter	1213	1474	1792	2178
0075	Margarine	1433	1742	2116	2574
0085					
0095	TOT. SALES	3748	4556	5538	6732
0105					
0115	EXPENSES				
0125					
0135	Graft	276	335	407	495
0145	Salaries	1654	2010	2443	2970
0155	Rent	662	804	977	1188
0165					
0175	TOT. EXP	2591	3149	3828	4653
0185					
0195	Pretax Inc	1138	1407	1710	2079
0205					
0215	Taxes	443	563	684	832
0225					
0235	NET INC.	694	844	1026	1247

					87.5 ICE 1 8001 PR

Something else to worry about is memory: Multiple pages chew up a lot of it. RM's designers were well aware of this problem, though, and have tried to help. While the program is running, it always displays in the status line the amount of memory still available, and the manual offers some tips on how to design reports that conserve memory. The program also includes a handy routine that can be used to calculate how many data cells will fit into the amount of memory you have available. After you have specified the proportion of numeric and text cells and given a few other parameters, you get a report on how many rows, columns, or pages will fit into the cube.

Operating RM requires a minimum of 128K RAM, but the program itself takes up more than half that amount, leaving you with only about 60K for your workspace. You can more than double the memory available for data by moving up to 192K, and the program is smart enough to use all the memory you can cram on board.

Built-in Programming Language

Besides the three-dimensional concept, RM's other big draw is its built-in EXEC programming language. Since operating this feature is more complex than splitting data cubes, its appeal is unlikely to be as broad. Still, even for those who won't make full use of the programming language, it is an effective way to create interactive screens, which will prompt naive users for data entry.

EXEC command files are like DOS batch files in that they can contain just about any RM command. However,

EXEC's 17 BASIC-like statements, such as IF... THEN, GOSUB, RETURN, and LET, allow for considerably more sophisticated applications than DOS batch files do.

Figure 7 is a sample EXEC program, named "Mortgage Analyzer." When run, it calls a preformatted data entry template named B.M.TEM (see Figure 8), and prompts for string and numeric variables. It displays all entered data, calculates the payment required to retire the mortgage, and sends the report—in boldface type—to the printer. The result is Figure 9. Since data and labels can be positioned on the screen exactly where you want them to appear on the printout, a similar program could be designed to fill in invoices, write checks, or print labels.

RM comes with a number of precoded

C
CURSOR
control is one of RM's
most unsophisticated
features.

EXEC programs far more complex and useful than our little 24-liner. They can be listed, modified, and plundered for good ideas to work into your own EXEC programs. Since they are stored in straight ASCII, programs can be written with EDLIN or with any word processor that handles ASCII files. Like all programming

Figure 7: A simple EXEC mortgage analyzer that prompts for data entry, calculates mortgage payments, and prints results.

```

10
11 REMORTGAGE ANALYZER
12
13 INPUT "NAME: "; N$
14 INPUT "ADDRESS: "; A$
15 INPUT "CITY: "; C$
16 INPUT "STATE: "; S$
17 INPUT "ZIP: "; Z$
18 INPUT "MORTGAGE AMOUNT: "; M$
19
20 REMORTGAGE ANALYZER: * DO
21
22 INPUT "ANNUAL INTEREST RATE IN DECIMAL POINT: "; R$
23
24 REMORTGAGE ANALYZER: * DO
25
26 INPUT "NUMBER OF PAYMENTS PER YEAR: "; C$
27
28 REMORTGAGE ANALYZER: * DO
29
30 INPUT "TOTAL NUMBER OF PAYMENTS IN MORTGAGE: "; E$
31
32
33 REMORTGAGE ANALYZER: * DO
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

```

languages, EXEC has its own syntactic eccentricities, but it is enough like BASIC that it can be learned easily.

So, what is there to dislike about Report Manager? Mainly, its ancestry. RM originally appeared under the name VictorColc and was designed as a CP/M program for the Vic 9000. A spokesman for Datamension explains that when the program was retooled for the IBM PC, the company designed a "generic" MS-DOS version, which virtually ignores the function keys. Thus, all but one of these ten wonderful keys are functionless.

Unfortunately, it's not hard to think of possible uses for the function keys. To move the cursor to a specific cell, for example, you must type the at sign (@) and then the cell coordinates. The at sign is a two-stroke combination that even practiced touch typists stumble over. "Yes, it gets pretty painful," concedes the Datamension spokesman, who vows that any subsequent versions for the PC will make full use of the keyboard's power. In the meantime, he recommends Pro-Key, or any other keyboard customizer, for users who are annoyed at having to hit two or three keys when one should do the job.

Cursor control is in fact one of RM's most unsophisticated features. The arrow keys do what you would expect, but the program doesn't offer anything fancy. The two-stroke command slash (/) Home will move the cursor to the upper-left-hand cell in the first page of the cube, and the slash key (/) End will move it to the lower-right corner of the last page. For anything in between, you're stuck with either that maddening at sign (@) command or a lot

How To Expand Your IBM

Exclusive six-function card expands workspace, increases speed, and boosts memory up to 576K.

The TITAN™ is the only expansion card that gives your IBM PC or XT both hard disk SASI interface and a parallel printer port. This advanced package also includes a pair of RS-232C serial ports, real-time clock/calendar with battery back-up, plus a choice of memory expansions. And everything slips into a single slot!



Pick a TITAN with parity-checked dynamic RAM from 64K to 576K. Each comes ready to run, complete with four super software selections. PSEUDO-DISK™ makes the RAM act like an exceptionally fast disk drive. PSEUDO-PRINT™ print spooler lets your computer calculate while the printer is running. WHATIME™ keeps track of date and time so you don't have to enter them at each system restart. HARDISK™ makes a 10MB Winchester addition plug-in easy.

Yes, it's a lot for one slot. And it's available now to add new utility to your IBM system.

Let us help you expand your IBM's productivity. For information on our multi-function boards and other Titan microcomputer products, see your computer dealer or contact: Titan Technologies, Inc., P.O. Box 8050, Ann Arbor, MI 48107; Telephone (313) 973-8422.

Sales and Marketing by The MARKETING RESOURCE GROUP, Costa Mesa, CA.



Titan
TECHNOLOGIES, INC.
FURNISHES SOLUTIONS DISTRICT OF MICHIGAN

IBM PC and XT are registered trademarks of International Business Machines Corp.
TITAN, PSEUDO-DISK, PSEUDO-PRINT, WHATIME, and HARDISK are trademarks of Titan Technologies, Inc.

CIRCLE 591 ON READER SERVICE CARD

Figure 8: A preformatted data entry template is used in the EXEC mortgage analyzer.

```

***** A ***** B ***** C ***** D *****
0013
0023
0033
0043
0053
0063
0073
0083
0093
0103
0113
0123
0133
0143
0153
0163
0173
0183
0193
0203
0213
0223
0233

                                PAYMENT REQUIRED
                                TO RETIRE A MORTGAGE

Mortgage Amount
Annual Interest Rate
No. of Payment Periods / Y
No. of Periods

MORTGAGE PAYMENT AMOUNT:

...Enter Your Name

                                CC  R011  IPR 1
  
```

of arrow-key action. Heavy dependence on arrow keys means that the number pad isn't much use. It can be toggled on and off with Num Lock, but constant switching from numbers to cursor control is hardly worth the effort.

Documentation is not one of RM's strong points either. The manual plods along and eventually covers just about everything you need to know, but explanations are unnecessarily terse. It is also inconsistent in minor ways. In the beginning it promises that all keystrokes to be entered by the user will be in boldface type. Most of the time, they are.

By contrast, the context-sensitive help screens, of which there are more than 30, are quite good, though not good enough to replace the manual. Users not familiar with spreadsheets will have to keep all too close an eye to the documentation.

As for the meatier areas of program design, you might quibble about deletion procedures. It takes no more effort (three keystrokes) to wipe out a row or column than to clean out the contents of a single cell. What's more, any column or row removed from the current page is blasted out of every other page in the data cube. You can lose a lot of work when you aim for the wrong row, and if you have been spoiled by fancy word processors, you could find yourself groping fruitlessly for the undelete key.

Three keystrokes is clearly too many for rubbing out a single cell; a function key would do very nicely, thank you. As for rows and columns, a Y/N prompt, while the targeted cells blinked or went into reverse video, would keep tempers cooler. The manual really means it when it says, "Exercise caution before using this [the

Figure 9: The result of the EXEC mortgage analyzer.

```

Harold Housebuyer

                                PAYMENT REQUIRED
                                TO RETIRE A MORTGAGE

Mortgage Amount                                75000.00
Annual Interest Rate                            .12
No. of Payment Periods / Y                      12
No. of Periods                                  240

MORTGAGE PAYMENT AMOUNT:                        825.81
  
```

delete] command."

For the most part, though, RM is a well-designed program, which the publisher seems committed to support. All registered users are encouraged to call the company's service number (which is supplied after registration), if they get in trouble. Datamension does not try to fob you off onto a salesman when you need support.

The company is also serious about protecting its program. The disk that comes in the original package is fully usable, but copy-protected. Only after you have sent in your name, address, and computer serial number will Datamension send you a copyable version. Each disk has its own serial number, so if the company finds bootleg copies floating around, it will know who to go after.

Report Manager is, after all, a program that the scrupulous might wish to copy. It is a powerful, versatile spreadsheet, which can hold its own in an item-by-item comparison with any of the big names. It may have a long way to go before it builds up a following, but it is a serious contender in the battle of the spreadsheets. With a few cosmetic changes it could be a real threat. /PC

LEAN & MEAN

ON PRICES FOR IBM-COMPATIBLE ACCESSORIES



IBM Binders & Cases

- identical to D-ring binders made for IBM
- stock colors are light blue and dark blue in the DOS 2.0 size
- all colors & sizes available for discount quantity orders
- minimum order is 5 sets of binders & slipcases

ID#10CPH\$49.95



Shugart-Panasonic Disk Drives

- 40 track double-sided
- better than IBM drives
- plugs right into IBM PC
- two attached drives available at discount

ID#115A455H Call for prices

Teac 80 Track Disk Drives

- 5 1/4" half-height
- 720K Bytes w/DOS 2.0
- Reads & writes 40 track diskettes automatically with J format

ID#8FD55FH\$325



PC-DOS TO CP/M-86

Reformatting Transfer Utility

- operates under CP/M-86 on your IBM PC
- insert single or double-sided PC-DOS diskette & transfer any file to a CP/M-86 diskette
- BASIC programs available for personal BASIC, MBASIC, etc.
- delivered on CP/M-86 formatted diskette
- written entirely in Assembly Language

ID#2PKS\$49.95

Maynard Electronics Disk Controller Cards

- Sandstar 5 1/4" - 8" controller compatible with IBM drives & single or double density 8" drives. Holds 3 modules.

ID#1MEH\$239.00

- IBM style controller

ID#10MEH\$179.00



Plug-in Modules

- Serial Port Module: strappable as Port #1 or #2

ID#2MEH\$95.00

- Centronics Parallel: attach IBM printer with this module

ID#4MEH\$68.00

- Clock calendar: Includes battery & boot-up software

ID#5MEH\$77.00

- Game I/O memory & hard disk modules also available.

Order direct from: International Disk, 7246 Remmet Ave., Suite 101, Canoga Park, CA 91303
213/992-0514. 213/704-6518 Calif residents add 6% LA 6 1/2% All mail order personal checks
held 10 days C.O.D. is cash only Basic shipping charges \$1.80 per pound Add \$1.00 for 2-day service.
C.O.D. add \$1.65 All foreign orders (except Canada) \$10.00 shipping & handling

CIRCLE 24 ON READER SERVICE CARD

*CP/M-86 is a registered trademark of Digital Research

THE 8087 IS IN STOCK!

MicroWare is the world's leading retailer of 8087s. We also have the most accurate statistics on chip reliability. They are: .01% infant mortality, .00% adult mortality and .02% 8088 incompatibility. As for ease of installation, we have never had a customer return a chip because of bent pins. We are so confident that you will be able to successfully install and use the chip that we offer a 180-day warranty with every chip we

sell. That's 90 days more than anyone else! To support the 8087 we stock the largest selection of 8087 software anywhere. This includes: three FORTRANS, three PASCALS, APL, Intel's ASM86 (the assembler used by IBM to design the PC), PL/M-88, several Cs, 87BASIC, 87MACRO and MATRIXPAK for very large matrices. If you have a real time or multi-user application, then you ought to consider RTOS™. It is

our implementation of Intel's Real Time, Multi-tasking Executive (IRMX). If you have a question about which language, compiler, operating system or application package is best suited to your problem, we can answer it. Just call:
Information and Orders—
617-746-7341
University, Corporate and Government Buyers—
617-746-7364



8087 Support from MicroWare

87 FORTRAN/ RTOS™

MicroWare's 8087 optimizing compiler utilizes overlays, arrays up to 64K, memory management and more. See our 1/2 page ad elsewhere in this issue for details.

... \$1350

MATRIXPAK™

Assembly language matrix routines callable from any 8087 compatible IBM compiler. Allows user-specified very large matrices. Size is limited by available ram

... \$150

87/88 GUIDE™

An excellent tutorial on writing 8087 code and interfacing it with compilers. Full of code that runs!

... \$30

MicroWare not only provides quality products but the support to make them work! Our users receive a monthly newsletter, two free software updates, and a HOT LINE to

FASTPAK™+8087™

This package includes a copy of our 87/88GUIDE™, a MicroWare-tested 8087 with installation instructions and one of the following powerful modules: 87BASIC™, 87PASCAL™, 87MACRO™, or 87FORTRAN™.

... \$375

87 MACRO™

Our complete 8087 software development package. It includes an 8087 "Preprocessor" which converts 8087 opcodes and operands into 8088 escape codes. Also contains the source code for a library of 8087 macros, and an object module which performs 8087 extensions including transcendental trigonometrics, hyperbolic functions, and number conversions.

... \$150

call for 8087 related advice. MicroWare is your complete CLEARING HOUSE for 8087 related products. We sell the compilers and programs you need at affordable prices.

8087 CHIP

with 6-month warranty ... \$223

87BASIC™

Our complete IEEE modifications to the IBM BASIC COMPILER. 87BASIC is user transparent. It includes patches to BASCOM.COM, BASCOM.LIB, and BASRUN.EXE.

... \$150

OTHER PRODUCTS

Microsoft Fortran 3.1	\$289
Microsoft Pascal 3.1	289
Supersoft Fortran	340
Microsoft Business Basic Compiler	495
Microsoft C Compiler with Librarian	450
Float87	125
Computer Innovations C/C66	345
Anderson-Bell Abstat	345
Energraphics	235
MicroWare 87BASIC+	75
MicroWare 87/88GUIDE	30
Microsoft Multiplex	195
Hayes Smartmodem 1200B	499
64K RAM Upgrade Kit	64
Standart Modular Expansion Boards	call
Epson FX-100 or C. 10th Printers	call

IBM and IBM Personal Computer are registered trademarks of IBM Corp. 8087, 8088, 8086, 8088 and PL/M-86 are trademarks of Intel Corp. FASTPAK, 87/88GUIDE, 87MACRO, 87BASIC, 87FORTRAN, RTOS, 87BASIC+, MATRIXPAK, and RTOS are trademarks of MicroWare, Inc.

MicroWare

P.O. Box 79
 Kingston, MA
 02364
 (617) 746-7341

You Can Talk To Us!

The VisiFolks present a "what-you-see-is-what-you-get" word processor. You may not like what you see.

VisiWord: What You See Is (Almost) What You Get

VisiWord (version 1.1)

VisiCorp

2895 Zanker Rd.

San Jose, CA 95134

(408) 946-9000

List Price: \$375

Requires: 128K (DOS 1.1) or 192K (DOS 2.0), one disk drive, video monitor, printer.

CIRCLE 616 ON READER SERVICE CARD

I am not using VisiWord to write this review. A deadline as inflexible as a fixed disk looms. I need speed; I need files with which I can telecommunicate to people in the office who don't have VisiWord; I need a nice, restful screen that doesn't fry my eyeballs and sear my brain while I'm working. VisiWord flunks on all counts.

Until a couple of years ago, most programs for microcomputers were designed by individuals, independent artists who knew what they wanted and figured somebody else would want it too. But, unfortunately, many of them were abysmally untalented or hopelessly uncreative. A select few (Seymour Rubinstein, of WordStar fame, and VisiCalc developers come to mind) produced software with elegance

and personality—commercial products with personal panache, like, say, Porsches.

Now the marketers are taking over. MBAs who wouldn't be caught dead wearing a plastic pocket protector, or even the same shirt two days in a row are conducting research studies to find out what software users want and are doing their damndest to give it to 'em. You don't like programs that take more than 15 minutes to learn? Fine, they'll deliver one that'll get you up and running in 10. You don't want to have to crack a manual? Fine, they'll give you help at the touch of a button.

What results from this approach is a program that makes for a great demonstration to people who don't know any better. "Wow!" these innocents cry. "You mean I can move the words around up there on the screen, and then print out what I just wrote? Neat!"

But when they get the disk home, they may be in for a few surprises. They discover the reason they "learned" the program so quickly was that it left out a lot of hard-to-learn features, which come in awfully handy once you get the hang of them.

They discover mysterious stuff in the back of the manual about "printer setup strings" and phone their dealers demanding to know what the word hexadecimal means. They finally realize that the program, which insists on triple confirmation of everything but the simplest deletion, is never going to stop treating them like a beginner. But that doesn't bother the marketing guys. After all, the sale has been made.

Design by Committee

VisiWord appears to have been designed by committee—a committee consisting of the Marx brothers (Groucho, Harpo, Chico), the Three Stooges (Larry, Curly, and Moe), Mr. Kludge, and the guy who placed the shift keys on the PC keyboard. What's sad is that a lot of people who don't know better are going to buy this mackerel and think it's caviar. What's sadder is that VisiSpell, a companion spelling checker, is one of the most interesting programs I've seen lately—a genuine original in the best sense. And what's sadder still is that VisiSpell was apparently designed independently and acquired by VisiCorp—a fact that does not bode

well for the much-trumpeted VisiOn integrated package. Maybe they should have called it DisiWord.

This isn't some prerelease VisiWord I'm talking about, either. This is version 1.1, a second release the VisiFolks say they sent out automatically (and, to their credit, gratis) to anyone with the earlier version who sent back the registration

card. The new version will run 128K RAM in DOS 1.1, and 192K RAM in DOS 2.0. It may be installed on RAM disks as well as hard disks, but the distribution disk is copy-protected.

Bordering on Insanity

How poorly conceived is VisiWord? Take one look at the editing screen (Figure

1) and you'll get a hint. The screen is framed by an undefeatable inverse-video border. It glares at you and glares at you, and there is no way to turn it off. If you use the program with any regularity, the border will be permanently etched into your mind in a matter of months. The glare is a sure cure for a lack of headaches. And it wastes precious screen space.

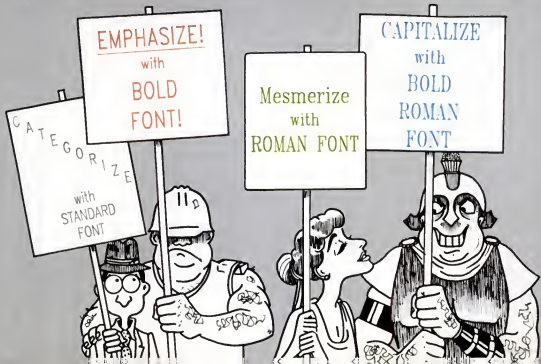
INTRODUCING

The first software program

Sign-Master is an exciting new program that for the first time lets you transform ordinary-looking presentations, proposals and special reports into dynamic, colorful word charts. Before Sign-Master, it required a

graphic artist or dedicated graphics processor to create impressive word charts, both time-consuming and more costly options. Now, with Sign-Master's amazing flexibility, you can produce presentation-quality word

charts on paper or acetate in six different type styles and in 16 different sizes — a real breakthrough when you consider that over 65% of all presentations consist of word-only formats. (When graphs are indicated to



If the text were in high-intensity video, you'd at least be able to adjust the contrast to turn down the border's brightness. It's not, and you can't. Believe me, it looks a lot worse in person than it does in a screen shot here. And if you've got a color monitor, you'll have to pry the secrets of multichrome out of VisiCorp's non-toll-free, customer support hotline. As delivered,

VisiWord comes up in white on black. Period.

How poorly executed is VisiWord? The manual tells you that "the VisiWord program does not use the Ctrl key, the Alt key, or any combination of those keys with any other key. If you use these keys, the program does not respond."

They wish it didn't respond. Ctrl-left

arrow gives you an s, and Ctrl-right arrow gives you a t. Three more surprises like these and I can type my nickname. You can find your name by hitting various Alt and Ctrl combinations, especially with the function keys. As the document writers recognized, this is not supposed to happen with well-designed programs.

Try some typing. The Lowell Thomas

SIGN-MASTER!™

to bring word charts to life!

highlight your data, ideas and conclusions, our Chart-Master™ graphics software is available to do the job.)

Sign-Master can also be used to create effective instruction materials, bulletin board an-

nouncements and direct mail pieces that demand attention. To generate real impact, Sign-Master word charts can be as colorful as you like, depending on the plotter you use. And you can be as creative as you like by capital-

izing or italicizing a single character, a single word, or an entire line at the touch of a button. In addition, margins can be justified left, right or centered.

Best of all, Sign-Master's on-line instructions, power and variety of options make you a "Sign Master" without special training.

Sign-Master — the first software program that brings word charts to life.

Sign-Master supports a wide variety of plotters from IBM, Panasonic, Hewlett-Packard, Houston Instruments, Yokogawa, Strobe, Amdek and many others, for use with IBM PC, PCXT and other compatible computers.

The retail price of Sign-Master is \$245.00. For a complete information kit and name of your nearest dealer, contact:

Decision Resources, Inc.
25 Sylvan Road S.
Westport, CT 06880
(203) 222-1974.

Sign-Master and Chart-Master are trademarks of Decision Resources, Inc.

DecisionResources, Inc.
Software Designed for Decision Makers
CIRCLE 245 ON READER SERVICE CARD



Memorial Cursor enjoys traveling all over the memory map. Often it jumps down to the lower left-hand corner of the screen between each of your keystrokes. Sometimes it goes beneath the L in the word Line on the 24 status line. Just moving the cursor from one line to another often (but not predictably) causes a perceptible and annoying delay. So does using the backspace key. A guy at VisiCorp actually tried to convince me that the wandering cursor was part of the design. Either the guy was attempting the classic prestidigitator's feat of turning a bug into a feature, or the committee member responsible for that part of the product was named Chico.

See It and Get It?

VisiPublicity claims that "what you see is what you get" with VisiWord. Not quite. Underlining, boldface, superscripting, and subscripting are all represented on the screen in the same nonprinting way—with inverse video. And you can't double-space your text on-screen. But otherwise, VisiWord comes pretty close. The program boasts "dynamic reformatting," which means that when you enter or delete text, the words shuffle around the screen automatically to reflect the current formatting and justification settings.

To those of you who have accidentally produced weird-looking WordStar paragraphs you've forgotten to fix with Ctrl-B, dynamic reformatting might seem the

answer to an oft-repeated prayer. Not the way VisiWord does it. When you're entering text at the end of a document, things aren't so bad. But when you make insertions, particularly at the top of the screen, you can type and type and type and never see a single character of what you're entering, until you stop for a breather or the screen catches up.

For some reason, VisiWord gives priority to keeping every part of the screen current but the part you're working on. You don't actually lose keystrokes; you just don't get to see them for a good long while. In justification mode, you may be somewhat unnerved to see many of your text entries appear from right to left.

My little TRS-80 Model 100 has a similar problem keeping the screen current. I've learned to avoid it by performing text insertions only on the very last line of the screen. Don't bother trying this technique with VisiWord; the program insists on sending you halfway up the screen when you reach the bottom line.

To give myself an idea of the snail-like pace of VisiWord, I hit the Enter key 20 times at the beginning of a document to get a nice, clean screen to work with. I waited an interminable 15 seconds until VisiWord was ready to acknowledge my presence again. I then went back to the top end hit the line deletion key (F5) 20 times. Only about ten of the carriage returns disappeared. This was the only time I actual-

ly lost keystrokes. Don't ask me why—ask Curly.

You'd think you would get wonderful cursor controls to keep up with these on-screen shenanigans. But you're wrong. Even the rudimentary text editor in my Model 100 gives me more ways to move the cursor than VisiWord. The omission of cursor movement by word (let alone sentence and paragraph and scrolling without moving the cursor) might have been acceptable on a 4-year-old Commodore PET. It's unforgivable on a PC. Moving your cursor from the right side of the screen to the middle gives you a glimmer of what sterner must be like. Deletion by word is virtually impossible.

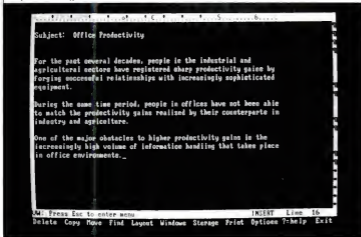
Escape to Menuland

So much for the basics. To do anything fancier, you invariably hit the Esc key, which tosses you into a one-line menu at the bottom of the screen. From there you choose from the available options, either by moving an inverse video cursor across the line or by pressing the first letter of your selection. This one-key approach is something of a VisiCorp hallmark, and it is to be an integral feature of VisiOn.

In theory, it's a great idea. In theory, everything you can do is right up there on the screen, and the key letters are mnemonic. But as implemented in VisiWord, it's a stiff. Some of the commands (D for Delete) are mnemonic; some (S for Storage) are the second choices when the logical choice (in this case, D for Disk) has already been used. I don't know how many times I hit F for Format instead of L for Layout. In this menu, F is for Find. It's on the Layout menu that F means Format, which means that if you want to do Footers, you have to hit Z. They done ran out again.

The options run across the menu line with no apparent rhyme or reason. The Quit or Exit choice is always at the far right and the question mark (?) or Help option is always directly to the left of it, but beyond that, the order was apparently left to Groucho's educated guess as to which options people would use most. The choice at the left is always the default, and a few of those defaults are exceptionally ill-chosen. The default on the Storage menu, for example, is to Load a file. Granted, you'll probably do that first, but you should be doing a lot more Saves than anything else.

Figure 1: VisiWord's screen is framed by a glowering inverse video border, and there is no way to turn it off.



A lot of typists, including me, prefer using the Ctrl key to Esc, because Esc forces your hand off home position. VisiWord adds yet another annoyance. From the editing screen, every time you hit the Esc key—and you have to hit it to do just about anything but type—the speaker chirps at you. The same thing happens with every press of the Home and End keys. And when you hit the “wrong” key from within a menu, you get a loud beep. There’s not a thing you can do about it, either. If it were a video game your kid brought home to play on your PC, you’d bite a hole in the disk. Imagine how much fun it would be to have a whole office full of these things, or to work next to the bleeping jerk who’s all thumbs! Harpo must’ve dreamed up this assault on the ears.

The Esc key doesn’t perform consistently, either. Usually it takes you into (or out of) a given situation. But from most of the submenus, it often will whisk you back to your text when that wasn’t really what you had in mind at all. If the Quit option is available, that’s usually what you should use to go to the previous menu. Even after some adjustment, it can remain confusing. And despite the audible click, reaction to the Esc key can be so slow you’re often tempted to hit it twice, thereby producing results precisely opposite to those you intended.

Blocks and Blockheads

In at least one way, the block functions available from the main menu (Delete,

Move, and Copy) suffer from comparison to the ones available on my cheesy little Model 100. When defining a block in VisiWord, you must move the cursor forward through your text. If you invoke the block functions when your cursor is at the end of the file, you’ll be able to do precisely nothing. If you ever want to delete the last couple of paragraphs of awful prose you’ve written, you’ll find this a real nuisance.

Once you’ve got your cursor at the precise beginning of the block you want to

AN EXTRA
tap on the Enter key,
and you can kiss the old
file goodbye.

deal with, you call the appropriate block function, decide whether you want Text or Column mode, move the cursor to the end of the block, hit the Enter key, and then (except in the case of deletion), move the cursor to where you want the text to go. There’s no provision, incidentally, for marking the point where moved text came from so that you can go back and see what happened in the old neighborhood.

Taking the Yes Option

Deletion is particularly screwy. In Text and Column modes, you’re asked to con-

firm that you really want to make the deletion, but there’s no way to review the marked text and check. If your reply is No, you have to start again.

And you may also choose to delete Memory (that is, your entire document). If your text has not been saved, VisiWord asks if you really want to make the deletion. Because of the worst chosen default in this program, when you hit Enter, you have chosen Yes, and you have just lost an entire file forever. The same thing happens when you try to Load a file into memory before the current document has been saved and when you use the Z (for Clear, of course) option from the Windows menu. An extra tap on the Enter key, and you can kiss the old file goodbye.

A program that refuses to let you kill a block without positive confirmation, but which has no compunction about letting you trash an entire file by touching the Enter key, seems a perfect example of committee design: Moe likes it one way, Larry the other; sage Curly decides to split the difference. Even the manual writers couldn’t believe this one; they tell you taking the Yes option will save your document. They should’ve taken that option for this part of the manual.

The dedicated deletion keys betray a Marxian influence. F5 deletes an entire line. F6 deletes to the end of the current line. The delete end backspace keys work in the usual ways, but not, for God knows what reason, on forced carriage returns. If you accidentally hit the Enter key, you can’t just backspace to get rid of the return;

We have developed an 8" diskette system called "THE FILE CONNECTION" that can be used to exchange source, data, and word processing files between the IBM PC and hundreds of other computer systems. We use a modified IBM diskette controller card to attach either 1 or 2 external 8" drives to the IBM PC. Our utilities work with all IBM models including the 3741, 5120, S/1, S/34, S/36, S/370, 43XX, and Displaywriter. Other systems include DEC, NCR, TRS80, Univac, Burroughs, Honeywell, and CP/M.

Our programs provide automatic format identification and except diskettes with 1 or 2 sides, single or double density, and 128, 256, 512, or 1024 bytes/sector. Source file reformatting and ASCII-EBCDIC conversion is included. The diskette can also be used as a 1.2 Mbyte or 320 Kbyte DOS drive.

The complete system price including TANGOON 848-2, enclosure, cable, and basic utility programs is \$1295 for one drive and \$1995 for two drives. For users who want to use their own drives, the basic utility programs and documentation are available for \$695. Payment is by check or C.O.D. with delivery within 10 days.



"THE FILE CONNECTION" 8" DISKETTE SYSTEM

FLAGSTAFF ENGINEERING • (602) 774-3588
2820 WEST DARLEEN • FLAGSTAFF, AZ 86001

you've got to move to the end of the previous line and use F6, or F5 if you didn't think much of that line anyway.

A PROMPT *will nag you if the current file is unsaved, and ask if you want to continue on your file- killing path.*

But the Undelete key (F9) bears Groucho's logical imprint. Delete a few lines with the F5 or F6 key. Hit Undelete. Wow! Like magic, they are back again, as though they'd never left. Now use the Delete Text option to trash a nice big block. Hit Undelete again. Zilch. Nada. Zip. The Undelete key works to undo only the minor damage caused by F5 and F6, not the potentially major disasters caused by block deletion. Jo Chico's immortal words: "There ain't no sanity clause."

Savior Text

Pressed to specify the one aspect of this program I'd deem the very worst, I would instantly reply, "saving text." Frequent saves are the only way to make sure your precious words find their way safely to disk before a band of terrorist accordion

players demoting freedom for Lawrence Welk blows up your local power substation. Even the supposedly difficult WordStar makes saves easy. Type Ctrl-KS and the file is saved, Ctrl-QP, and the cursor is back to where it was in your text. WordStar automatically renames your previous version as a backup file, which you can retrieve if you decide you didn't really want to save the current version after all. And while you're waiting for the save to be accomplished, you can look over the text you've just entered.

With VisiWord, saving is a chore: Esc, S(torage), (S)ave, Y(es), you want to replace the current file Y(es), you really want to overwrite it. VisiWord makes no backup; it simply overwrites the current file. You could save the file a second time as FILENAME.BAK, but that would require either typing it to each time or selecting it from a directory and then performing an additional (and time-consuming) save.

While all this is happening, you get to look at a screen devoid of everything but a menu. Then you get to hit the Esc key and wait a while to return to your document. After some whirling from the disk drives, you finally get back to your text. But having to abandon it in the first place is an unnecessary distraction, which breaks your concentration. It's just another reason you'll someday be cursing those melodic accordion players when you could have been being laughingly insouciantly.

The VisiCang's manual keeps congratulating the program on the way it reminds

you when a file remains unsaved. If you try to print a file or exit the program, a prompt will nag you if the current file is unsaved, and ask if you want to continue on your file-killing path, but only after the disk has chugged and chugged and loaded the Print or Exit routine. This time the default is, correctly, No. The next question in any well-designed system would be something on the order of, "So maybe you want to save it, huh?" Not in the VisiWorld. The No answer sends the disk spinning, reloads the editing module, and takes you back to your text.

Again and Again

The find-and-replace functions work backwards and forwards, but I found them to be slow, like most other VisiWord functions. The Find menu also is rather confusing, offering options that are unavailable until you've chosen others. If you go through Find, then type in a search string (30 character maximum), and then choose the Replace option, you get an error message. Seems you have to choose Next or Previous first.

You can repeat a search with the Again key (F2), but only if you haven't typed in so much as a single character since the previous search. When you press the Again key, the only indication of what's going on is a blinking asterisk in the right corner of the border. And the descriptions on line 25 can be downright misleading. If you select Previous, the option for search-log, by typing a P instead of using the cursor, the program does not change the high-

NOT ONLY ANOTHER TECHNOLOGICAL BREAKTHROUGH BUT ALSO EASY TO USE AND TO INSTALL

Modems are the most important device used to link two products together through ordinary telephone lines at miles apart! The INCOMM STARCOM, a 300/1200 bps Auto Dial, Auto Answer, Auto Log On modem was introduced to

link two high speed devices together with having absolutely NO knowledge of computers or communications in general. Anybody can install and operate the STARCOM Family in a few minutes.

- STARCOM is a 300/1200 bps Auto Dial/Auto Log On/Auto Answer Modem.
- OSCOM is a 300/1200 bps Auto Dial/Auto Log On/Auto Answer with Osborne (TM) Computer Software (included) modem.
- COMSOFT is a communication software package.
- OEM MODEM BOARD is also available for custom installation.



**SEND FOR
FULL LINE
CATALOG**

of peripheral
including Modems,
Mouses, Switches
and Breaker Boxes

**DEALER INQUIRIES
INVITED
(312) 459-8881
or 1-800-323-2666**

INCOMM

115 N. WOLF RD. WHEELING, IL 60090

**THE
STARCOM
\$450.**



**THE
OSCOM
\$520.**

SO COMPACT!
Only 1 1/2" x 6 1/2" x 7 1/2" 1.5 lbs
Fits in your coat pocket!

Get all the facts about the IBM Personal Computer.

Get PCTM Magazine!

Whether you already own an IBM Personal Computer or you're thinking about buying one, you need PC Magazine.

PC Magazine is the independent guide to IBM Personal Computers. Each monthly issue is packed with the latest information for everyone who's interested in IBM Personal Computers.

This is *the* magazine for finding out how to put together the best IBM "PC" system...and how to get the most out of it. Every month you'll receive hundreds of colorful pages of evaluations, insights, and straight talk from respected experts—professionals in computer science as well as lawyers, businessmen, writers, educators and many others.

PC covers software, hardware, applications, and every other topic of importance to the thousands of IBM Personal Computer users who read it. To make sure that we give you the facts you need, we include a special "User-to-User" section, a "PC Wish List," and news about IBM Personal Computer clubs, events and publications.

Right now you can save up to 33% on an introductory subscription. And if you're ever dissatisfied with PC, just write and tell us—you'll receive a prompt refund for all the unmailed issues remaining in your subscription.



PCTM Magazine

P.O. Box 2443, Boulder, CO 80302

Yes! I want to subscribe to PC, the independent guide to IBM Personal Computers:

- ☐ One year (26 issues) only \$29.97—14% off
☐ Two years only \$52.97—24% off
☐ Three years only \$69.97—33% off

Savings based on full one-year subscription rate of \$34.97.

CHECK ONE: ☐ Payment enclosed. ☐ Bill me later.

45101

Mr./Mrs./Ms. _____

(please print full name)

Company _____

Address _____

City _____ State _____ Zip _____

Offer valid only in the U.S. its territories and possessions. Please allow 30 to 60 days for delivery of first issue.

lighting, leading you to the conclusion that it's searching forward instead of backward. The program will do a global search and replace either automatically or with prompting.

But there's no way to enter a carriage return or special character in a search string, or to search for underlined or boldfaced text. If you want to turn a single-spaced document with two spaces between each paragraph into a double-spaced document with no extra spaces between each paragraph, well, all you do-it-yourselfers will be delighted.

Not for Attribution

Underlining, boldface, superscripting, and subscripting? Why not? To underline, you use the F8 key. With most other word processors, you mark the start and the end of the text you want underlined, and the program does the rest. Not here. Nyuk-nyuk-nyuking fiendishly—Moe took charge of this one.

You have to hold down the underline key as it moves the cursor one slow character at a time through the section you want underlined and marks the text in inverse video. If it's a long section, you can probably polish off a couple of chapters of James Michener's latest blockbuster while you wait. And good luck to you, sir or madam, if you decide you don't want the section underlined after all. You won't find the method in the manual, but if you're smart enough to look for the help screen, you will discover that you may undo the damage either by holding down the underline key the cursor crawls through your text once more or—for more fun—simply type over the underlined text.

Or you can change the underlining to boldfacing, superscripting, and subscripting, which are available from the Layout menu. You can't combine attributes, so if you want something both underlined and boldfaced, or superscripted and boldfaced, you're out of luck. The last one you choose is the one you get. And the only way to find out which attribute has been given to an inverse-video letter is to move the cursor to it and check the status line, which will give you a comment like U/L, EN/P, ABOVE, or BELOW.

Three Sheets to the Wind

Another problem is maximum document size. With customary imprecision,

the manual gives you such figures as "25 to 50 typewritten pages" with DOS 1.1, and 20 to 40 of those pages with DOS 2.0, assuming a system with 192K RAM. Working in 128K with DOS 1.1, Visi claims an 8 to 10 page maximum. That's not exactly gargantuan. Fortunately—though it can cause significant irritation in the editing process—files can be linked. But only from the end of one to the beginning of another. There's no way to link multiple files from one master file.

THE SHEETS
*are among VisiWord's
best features. They're
invisible on the screen;
they don't waste screen
space that should
properly be devoted to
your text.*

Which brings us to the sheets department. VisiWord has more sheets than a January white sale. There are Appendix sheets, Format sheets, Message sheets, Header sheets, and Footer sheets, not to mention Rulers, which are sheets incognito. You call these sheets up from the Format menu and insert them invisibly (a the appears in the left hand border) into the text.

With the exception of Appendix sheets, which are valid only in the very last line of a document (VisiWord graciously will let you insert elsewhere, where they have absolutely no effect), sheets control the formatting of a document from the point at which they are inserted to the next appearance of a sheet of the same kind. Format sheets let you change line spacing, justification, character pitch, and page numbering. Header and footer sheets let you specify headings and footings of up to three lines each. Rulers let you adjust margins and tab stops. Appendix sheets let you invoke another file from the current file. And Message sheets let you send a message to the screen at print time.

The way you set these things isn't terribly difficult, and you may insert all five

kinds of sheets on one line. But you're supposed to insert a sheet only on a line immediately following a hard carriage return. All options but the rulers let you work on a sheet even when the cursor isn't on such a line; only when you finally try to insert the sheet into the text do you get an error message. The rulers simply refuse to do your bidding until you realize your mistake.

Despotic Rulers

In the rulers, VisiWord requires you to use the Indentation option instead of Margin to set the left margin. The Ruler option also produced a reproducible system crash. The first time, when I chose a column width of 255 (the program's supposed maximum) and hit Esc, VisiWord burped and sent me into, of all things, Casette BASIC. The second time, VisiWord sent a disk drive spinning merrily for 15 seconds or so before offering me a PC PARTIVITY CHECK 2 error message on the screen. I was rather chagrined that it forgot to ask me if I had saved my file before these things happened; three pages of text disappeared as swiftly as if Doug Henning had performed his art on them. The whole committee probably knocked its heads together on this one.

Headers and footers are easy enough to enter, but they offer possibilities for trouble. You get three fields, each with 40 characters to play with: one justified left, one right, and one center. If you're not careful, the text you enter in one field can overlap with another when it goes to your printer. To get a simple header of more than 40 characters, with a page number at the right, will require some careful counting. If you're working on a document wider than 120 columns and require more than 40 continuous columns of header (in a report incorporating a spreadsheet, for example), too bad for you. There's no provision for book-style page numbering to appear alternately at the right end left corners of the pages.

But the sheets are among VisiWord's best features. They're invisible on the screen; they don't waste screen space that should properly be devoted to your text. And VisiWord stores the formatting information in the file with the text, which helps it keep track of such features as centering (accomplished with one touch of the F9 key) and paragraph indentation (F4), even if you decide to change the mar-



25 Mb the hard way.



25 Mb the Rana way.

CIRCLE 530 ON READER SERVICE CARD

Never The Same Game Twice

Rogue

Now your PC can handle Rogue... can you?



**Rogue, the most popular
UNIX® game ever,
now runs under MS-DOS®
on the IBM PC.**

■ **ROGUE's many intricacies make its challenge a lasting one** Expert game writers spent four man years devising the most exciting adventure you'll ever undertake. The quest for the Amulet of Yendor.

■ **Every game of ROGUE is different** You win by developing your ROGUE character, not memorizing events

■ **ROGUE plays quickly** It's so full of unpredictable monsters, complex magic and hidden dangers you never have to wait for action

■ **ROGUE remembers and displays strategic information** You never interrupt the action to make separate maps or notes

Don't Wait To Challenge Yourself

Order ROGUE Today—Call toll-free:

800-538-8157 ext. 973

800-672-3470 ext. 973 in California

And use your Visa or MasterCard

\$44.95 (add \$2.00 postage and handling)

or send check or money order to

AI Design

P.O. Box 3685

San Jose, CA 95055

(408) 296-1634

Ask for **ROGUE** at your computer store

Requirements

IBM Personal Computer or IBM Personal Computer XT • DOS 1.1 or 2.0 • 128K of Memory • Single Disk Drive • Monochrome or Color monitor

*UNIX is a trademark of Bell Labs, Inc.

*MS-DOS is a trademark of Microsoft, Inc.



CIRCLE 196 ON READER SERVICE CARD

gins. This is one place many other screen-oriented programs, including WordStar, fall down on the job. Reset the margins in a WordStar file with centered or indented text, and the centered text won't automatically be centered or indented anymore.

VisiWord also gets high marks for its page-break display. A row of diamonds on the screen delineates page breaks, which you can force with the F3 (New Page) key. As far as I can determine, the display remains accurate even when the page length or heading margination changes within the document—something WordStar loses track of.

On the other hand, the only way to tell what page you're on is to start at the beginning, scroll through, and count the rows of diamonds. VisiWord will give you a word (but not character) count. To get it, along with information on how much text is above and below the cursor and how much memory remains for your document, you hit Esc, S(storage), M(maintenance), U(sage) and wait about 10 seconds. It then takes about 5 more seconds to get back to your text. Nowhere in the manual is there any explanation of how VisiWord decides what's a word end what is not.

It Does Do Windows

VisiWord may not have every feature you want, but it does do windows. This is the feature I miss most in WordStar. The advantage of windowing is that you can

split the screen and work on two (or, in some other systems, more) files at once. This can be great for writing an article while scrolling through your notes or merging part of one file into another. But I hope VisiWord's implementation doesn't become a standard.

When you decide to set up VisiWord windows (press Esc, W(indows), O(pen)), you can split the screen horizontally at whatever line you choose. The bright border then moves down to create a lower window, leaving whatever text remains on the top of the screen. But only the lower window is "active" (Figure 2). You can't do anything in the upper one unless you switch the active window (press Esc, W(indows), S(witch)), at which point the text on the bottom becomes inaccessible until you switch back. Marking text in the active window and moving or copying it to the other window works exactly the same way as a regular move or copy, with one added prompt, which asks where the text is going.

It would be nice if you could at least scroll the inactive text without switching windows, but VisiWord won't let you. Switching windows takes only three keystrokes, but with one empty window and one 5-page file, VisiWord took 7 seconds just to make the switch—one more irritating delay. And if you type on the bottom line, VisiWord insists on sending you halfway up the window even if that window

Figure 2: A VisiWord screen with a windowed section. The text in the top half of the screen is not active.

Subject: Office Productivity

For the past several decades, people in the industrial and agricultural sectors have registered sharp productivity gains by forging successful relationships with increasingly sophisticated equipment.

Department	Number of People	Budget by Quarter
Marketing	34	458,000
Operations	47	212,000
Development	75	617,000
Finance	18	325,000
Publications	34	195,000
Manufacturing	258	1,270,000

AI Press Esc to enter menu

INSERT Line 2

Delete Copy Move Find Layout Windows Storage Print Options Help Exit



Introducing the First 2.5 Mb Minifloppy Drive.

Isn't it just like Rana Systems to introduce a floppy disk drive for the IBM® with the mass storage benefits of a hard disk, plus the floppy's strength of removable media. The first minifloppy that stores an incredible 2.5 megabytes on a single diskette. Imagine, storing a word processor, a spelling checker, mailing list, and dictionary on one floppy. With megabytes to spare.

Rana's new drive needs only 10 floppies to give you all the capacity of five 5-megabyte hard discs. But that's not the limit. In fact, there is no limit. Like any floppy with its removable media, you can use diskette after diskette to increase your storage. Our expanded capacity disk drive not only acts like a hard disk, it also serves as an ideal back-up for one.

And that's just the beginning, because Rana's drive introduces totally new "closed loop servo" minifloppy technology, making the drive insensitive to temperature or humidity. Rana's controller card can be used with standard internal drives also, so you don't have to

use an additional slot. Our drive comes with its own power supply, software enhancements for PC-DOS 2.0 and 1.1, and CP/M-86®, and a box of diskettes. Everything you'll need to make your IBM operate to its maximum potential.



The new 2.5 megabyte minifloppy drive, available first for the IBM® PC and XT and soon for the Apple®. It's Rana's latest proof that to stay a step ahead, you've got to lead the way.



Rana Systems

© 1986 Rana Systems

21000 Quaker Court, Irvine, CA 92614. Tel. 415/441-1100. Fax 415/441-1101. Telex 150000 RANA. Cable 150000 RANA. Rana Systems is a registered trademark of Rana Systems, Inc. IBM, PC-DOS, and CP/M are trademarks of International Business Machines Corporation. Apple is a registered trademark of Apple Computer, Inc.

IBM, PC-DOS, and CP/M are trademarks of International Business Machines Corporation. Apple is a registered trademark of Apple Computer, Inc. Rana Systems is a registered trademark of Rana Systems, Inc. Circle 333 on Reader Service Card.

measures only five lines high.

Using the windows feature also can lead to a certain amount of confusion. Since you can have the same file, with the same filename, in both windows, it's by no means difficult to save the wrong version and overwrite the one you really want. VisiWord prompts you that a file is

unsaved if you try to close out a window before saving it, but I somehow managed to wipe one window out by accident—probably because of those weird defaults. And there's no way, short of calling up the Storage menu from the active window, to find out the name of the file in either window.

You also have to leave your text and go out to the Storage menu to load, rename, or delete a file. You can't copy a file to another filename, unless it's the file you're currently working on. And the directory, also available only from the Storage menu, comes up in one unalphabetized column that you have to page through with the PgDn and PgUp keys—a miserable approach compared to WordStar's alphabetized multicolumn directory. The Storage menu also will let you format a disk; but, contrary to standard PC terminology, VisiWord calls the process "initializing."

You also can read an entire file into another from the storage menu. You receive the query, "Is the cursor correctly positioned in the text?" But, the only way to find out is to exit the function, go back to the editing screen to check, and start over. We are not amused, Groucho.

One-Liners

Decimal tabbing is available with the F1 key. Everything will be printed from right to left from the tab stop until you type a decimal point. It's handy for lining up columns of numbers.

Words connected by hyphens will not be separated at line breaks. That's fine for people submitting manuscripts to printers, but for everyone else it's the wrong choice. The procedure for entering soft, or ghost, hyphens is awkward, and there's no hyphenation aid even in the automatic justification mode. Nor is there a margin release to let you stick a character or two outside the defined boundaries.

Help screens are available from most menus. In some cases they're more useful than the manual, though occasionally they lack detail on the specific process you're trying to perform. If you ask for help while entering an Append sheet, for example, you get only a general and unhelpful screen applying to the entire Format menu.

You can define your own start-up settings for VisiWord by creating a special blank file with Format and Ruler sheets and saving them to disk. If the file isn't blank, you can save it anyway; to what effect, I know not.

You can also change the default disk drive. But if you don't have a fixed disk you can't change both. The two necessary files won't fit on the crowded distribution disk. In fact, according to the documentation, the format and ruler defaults won't

ALL YOUR IBM® NEEDS!



System unit with 64K, 2 double-sided double-density, Disk Dr. 320K etc. Monochrome display and printer adapter, PC DOS, Disk drive controller



EAGLE
PC-2
The best IBM compatible!

THE PROFESSIONAL WORD PROCESSING SYSTEM
System unit with 64K, 2.5DD 320K Diskette w/monitor, IBM® monochrome monitor, IBM® monochrome display/printer board adapter, PC DOS 1.1, VisiWriter word processing package, Printer cable and the Brother HR-15 13 CPS daisy wheel printer

Now Only **\$3749.95**

NEC 3550 SPINWRITER
LETTER QUALITY PRINTER



Now Only **\$1849.00**

Parallel Bidirectional, 35 CPS rugged construction, 1/2 auto optional spacing, Built-in shadow printing, Justification, Centering, Underlining, Subscript, subscript



DIXLER-REED EXP-550
LETTER QUALITY PRINTER
Now Only **\$644.95**

One of the world's leading manufacturers of electronic typewriters offers you this excellent feature in a low price dot printer. Parallel Bidirectional, 12 CPS, 3 pitch, optional spacing. Bold type, Subscript, subscript

ACCESSORIES & PERIPHERALS—TALLGRASS HARD DRIVES IN STOCK!

PC-MATE IBM® Partner Dealer
FIVE-DISK The most popular multi-function expansion board
64K \$279.95 256K \$399.95

AST RESEARCH Mega-15 1.44 3.5 clock software and disk \$269.95 256K \$499.95

QUADRAM Quad Board-64K 279.95 256K \$399.95

PRYSTIME TEST SPECTRUM with catalog 1 serial port and printer port on NEWER style and print spooling software—64K \$79.95 256K \$99.95

AT TRAINING PROGRAMS FOR
• PC DOS • WORD STAR • Q-BASE • Chess **\$579.95**

IBM ORIGINAL 5.1/5 KESKETTE
Double-sided, Double-density 1/2 tape
TOK 5.1/5 5DD0 27.95 TOK 5.1/5 5DD0 39.95

NEWMEDIA 5.1/5 5DD000.95 Meant HD 5.1/5 5DD000.95 44.95

KEYBOARD Extension Cable by Curtis \$4.95

PC Disk Cover Set by Tri-Mat \$9.95

HAYES 1200 Smartmodem \$69.95

HAYES 1200B Smartmodem \$69.95

IBM® is a registered trademark of International Business Machines Corp. IBM® is a registered trademark of Digital Research Inc.

47st Computer
Computers and Business Equipment
A Division of 47st Photo Inc.

Items are sold on "as is" basis and are subject to availability. Not responsible for typographical errors. This ad supplements our ads whenever ordered before this date. Prices are in U.S. dollars. All orders subject to credit review and acceptance. Minimum order \$25. No shipping & handling fee.

128K RAM (expandable to 512K on main CPU board), 2.5DD 320K disk drives, monochrome display/monitor, 2 async. serial ports RS 232, 1 parallel port, MS-DOS, CP/M® 86 and the following software: EagleWriter, EagleCalc, Autodrive and the Random House 50,000 word proofreader

Call or write for low price!

EPSON
with graphics plus, 160 CPS, 136 231 columns
FX-100 FT
IN STOCK! SUPER LOW PRICE.

Call for great prices on all EPSON printers!
CITIZEN F-10 Letter quality w/parallel port 40 CPS built-in word processing functions **\$1199**

OKIDATA
82A 120 CPS Parallel/Serial 399.95
82A 120 CPS Parallel/Serial, Takes 15" paper 599.95
82A 120 CPS Parallel 499.95
NEW 95 160 CPS Parallel, Takes 15" paper 779.95
OKIDATA 82A Letter Quality 1777.95
SMITH CORONA TP-1 Letter Quality 399.95

MONITORS
AMDEK COLOR II Hires RGB 449.95
QUADRAM QUADRAM Hires RGB Color IBM 494.95

IBM® SOFTWARE

Autodrive 79.95 **Personal Investor** 154.95
CrossTalk 119.95 **P/S Report** 89.95
O'Base II 399.95 **P/S File** 84.95
Easyprint II 259.95 **ProKey** 149.95
Multi Plan 187.50 **Sideways** 149.95
Norton Utilities 59.95 **TW II** 299.95
PC Tutor 1.1 or 2.0 44.95 **Versatool** 299.95
Personal Finance 89.95 **Multimate** 249.95

Alpha
Apple's IBM® Connection 149.95
Data Base Manager II Integrator 219.95

WORDSTAR
Desk Top Plan II 229.95 **VerbatimPlot** 219.95
Verfile 199.95 **Veratool** 299.95
Verstar 199.95 **COX Wordstar Training** 59.95
Veri Calc 256K 129.95 **COX Veri Training** 59.95
Veristat 219.95 **COX How to use PC** 59.95

CP/M® 86 44.95 **Concurrent CP/M® 86** 249.95

MICRO-PRO PROFESSIONAL
3.30 Wordstar Main Menu Spellstar and Star index 399.95
Infostar (Data base management system) 249.95

CORPORATE ACCOUNTS WELCOME (212) 260-4410

TOLL FREE OUT OF STATE

800-221-7774

800-221-5858

87 West 47th Street, New York, NY 10036

115 West 45th Street, New York, NY 10036

MAIL ORDER ADDRESS: 20 E. 19th St., Rm. 411, NYC 10003

Circle 242 on Reader Service Card

SUCH POWERFUL GRAPHICS AND STATISTICS FOR SO LITTLE

Simply Amazing! PLOTTRAX 2 lets you analyze raw data and convert it to easy-to-understand graphics. No other product offers the advanced graphics and statistics features of PLOTTRAX 2 and a money-back guarantee . . . at any price! Our Policy: Your money back if not completely satisfied. See a demonstration at your dealer or contact: OMICRON Software, 57 Executive Park, Suite 590, Atlanta, Georgia 30329, 404/325-0124.

- x-y graphs and scatter plots
- Bar charts and pie charts
- Linear, polynomial and multiple regression
- Variance/covariance
- Correlation matrix

- 4,000 data points per graph
- Log and semi-log plotting
- Software Update Policy
- Compatible with most printers and plotters
- And much more
- All for only \$340

PLOTTRAX
By **Omicron**

CIRCLE 348 ON READER SERVICE CARD



Omicron

always fit either. The committee must've remembered all the laughs they got from those THINK signs with the tiny Ks crammed in at the right.

File Follies

VisiWord produces some of the screwiest files I have ever seen. If you try to

TYPE them from DOS, you'll see all sorts of weird, happy faces and hear beeps and the like, which the program uses for internal housekeeping. But somebody also decided to use ASCII 26, the End of File character, for a purpose other than to mark the end of the file. This may cause you no end of grief if you're trying to modem a file

and your communications software quits at the first ASCII 26, or if the other guy's software strips out end-of-file characters. You'll have to print the file to disk to transmit it, thereby losing important formatting information.

What You Get Is What We Give

Now, for the Print menu. First point: If your printer isn't on the list that VisiWord supports (Figure 3), you may as well go elsewhere. If yours falls under the category of "Other Printer" or "Other Printer with Setup Strings," no character attributes of any kind, from underlining to superscripting, will be available to you via the standard methods, and you're likely to have trouble doing such things as double-spacing. True, for attributes, you may define up to four custom "printer setup strings" in a Format sheet and then use them from the Format menu as you would normal character attributes. In most cases, however, you will need two of these custom strings for each attribute—one to turn the attribute on and the other to turn it off. Using this setup will be even more annoying.

Figure 3: Printers supported by VisiWord. If yours isn't specifically mentioned, you may have trouble printing.

Diablo 630
Epson MX-80 or MX-100 (NO Graftax-plus)
Epson MX/FX - (80 or 100) with Graftax-plus
IBM 80 CFS Matrix Printer
IBM 80 CFS Matrix Printer
NEC Spinwriter model 3550
NEC Spinwriter model 7710
NEC Spinwriter model 7730
NEC PC-8023A-C
Brother HR-1
Okidata (Microline) 82A or 83A
Okidata (Microline) 84 Step 2
Okidata (Microline) 84/92/93
Qume Sprint 9 or 11 Plus
Other Printer
Other Printer with Setup Strings

Pascal and C Programmers

► Blaise Computing's productivity tools allow Pascal and C programmers to develop reliable software taking full advantage of the capabilities of the IBM PC and XT. Support for Microsoft and IBM Pascal, and Microsoft (Lattice) C is provided. Because all routines are carefully constructed in the language for which they were designed, the tools provide an excellent model. Pascal procedure support is implemented as separately compiled units, and the C functions are delivered as part of a function library. Now you can write your applications rapidly in the two most powerful languages available for the IBM PC. All packages come with a comprehensive Reference Manual, extensive examples and sample programs.

▼ TOOLS

All Source Code is included

Total string capability, complete screen access, keyboard handling, a graphics interface access to all BIOS functions, and much more are provided in over 40 routines. All routines are carefully crafted and documented to give you the information and flexibility you need. A general Macro Assembler BIOS gate allows you to access any BIOS function from Pascal or C, and demonstrates how to interface assembly language routines. Everyone using Pascal or C should have TOOLS. User Manual only \$30.

▼ TOOLS 2

All Source Code is included

The power of DOS 2.0 is supported using high level Pascal procedures or C functions. Program chaining, DOS internal and external command execution, use of all available memory, extended file handling, and other utilities are some of the features provided. A general DOS gate allows you to access any DOS function from Pascal or C. User Manual only \$30.

▼ VIEW MANAGER

Source Code available

VIEW MANAGER is a screen support system of a mainframe for the IBM Personal Computer. VIEW MANAGER is a menu driven, screen oriented system allowing you to develop user oriented screen interfaces. Screens are constructed with a true Screen Painter supporting any attribute or color, and the screens are stored efficiently in a Screen Database. Database utilities allow you to copy screens to stand-alone databases and to archive screens. VIEW/LIBRARY supports access to screens and true block mode data capture and display from application programs. Available soon will be VIEW LIBRARY for Microsoft (Lattice) C. The source to the procedure library is available for an additional \$50.00. Demonstration diskette and User Manual \$35.

► VIEW MANAGER, TOOLS and TOOLS 2 run on the IBM Personal Computer and XT. TOOLS 2 requires DOS 2.0. TOOLS and VIEW MANAGER can be used with any version of DOS. Specify if you wish Pascal (Microsoft and IBM) or Microsoft (Lattice) C versions. Blaise Computing can also provide you with the Microsoft Pascal and C compilers with qualified support. Call or write for details.

TOOLS 125.00
TOOLS 2 100.00
VIEW MANAGER 275.00
VIEW MANAGER (with Library Source) 425.00
MS-Pascal Compiler 325.00
Microsoft C Compiler 450.00

1609 Acton Street
Berkeley CA 94702
(415) 524-6603

► BLAISE
COMPUTING
INC.



CIRCLE 150 ON READER SERVICE CARD

ing than the standard methods, and potentially devastating, should you forget the "off" marker, which on-screen will look identical to the "on" marker.

If you do have a printer that VisiWord supports, you can use these "printer setup strings" for such things as expanded or compressed characters. If not, forget it. I don't even want to think about what I would have to do to get my unsupported IDS Prism to underline text this way. That's one more reason I'm not writing this with VisiWord.

I'm at a loss to decide how good VisiWord is even supposed to be at printing, since the documentation omits most of the information needed to find out. Will the program do microspace justification? Will it do true proportional spacing? The manual doesn't tell you. But since there are no options for adjusting any of these possibilities, my guess is you're not going to have much control over them, unless you seed a "printer setup string" at the beginning of your document. Maybe VisiCorp should call this program "What you get is what we give you."

At press time, a VisiGent Informed me that microspace justification is indeed supported on printers than can do it (something I was unable to confirm with the equipment available to me), and explained that a customer service line will supply debug patches to let unsupported printers print character attributes. He suggested that users of unsupported printers first try the Okidata Microline 82 option, closest thing to "plain vanilla." When I tried it with my Prism, I got underlining and boldface, but I also got a character width I hadn't specified. Close. But on cigar.

Limited Options

VisiWord will print only the document currently in memory, with the option of printing either to a printer or to a disk. In printing to disk, you have the choice of creating a fully formatted image of the document complete with printer controls, or a PC-DOS file, which eliminates printer controls and such things as headers and footers.

The DOS-file option could be a valuable feature for transporting VisiWord files to other programs, but the DOS files it created when I tried it all had two carriage returns and one line feed between each line—not exactly a standard format. Not

even the simplest three-line batch file created in that format would function properly, and the extra line feed is a mess to clean up, even with a program like Word-Stor. If you're interested in a program editor, look elsewhere.

There's no provision for printing multiple copies automatically. You may begin

printing either at the beginning of your text or at the cursor position. If the cursor is near the end of a longish document, however, VisiWord will seem to have died. Bear with it; it's just looking through your text at its usual tortoiselike pace. Some sort of message to fill the empty screen might have been nice.



SCHEDULE, BUDGET AND TRACK YOUR PROJECTS . . . WITH JOBTRAX JOBTRAX is a planning and monitoring tool for engineering, architectural and construction projects. You can easily budget, schedule, and plan manpower and resource requirements. Monitor project status with easy-to-read graphical reports and important status information. Includes CPM (Critical Path Method) scheduling. Built-in screen editor and data manager. \$345. See a demonstration at your dealer or contact OMICRON Software, 57 Executive Park, Suite 590, Atlanta, Georgia 30329, 404/325-0124.

JOBTRAX
By Omicron

CIRCLE 305 ON READER SERVICE CARD

You do get a message when the print spooling feature goes into action, though. Since it works by formatting the file and writing it to disk, you wait until the process is through. Once you're allowed back to the editing screen, the functions there are even slower than usual. Mr. Kludge's participation is evident here.

When you return to your document from the print menu, you find the cursor somewhere in the first few lines. Considering that the program has to know where the cursor is in order to begin printing on the current cursor line, this must be just another of Curly's little boffs.

Want some sort of form-letter function?

Buy VisiFile. But don't rush. According to the VisiWord documentation, you can't include character attributes in any merged document. So much for emphasizing that fantastic new feature.

Want to print a speech with triple spacing? No can do.

Wanna Buy a Manual?

The short "QuickStart" tutorial takes the novice user only through the simplest aspects of creating a document, but unless that user has an IBM printer, the document won't turn into hard copy without assiduous study of the manual's appendixes. Even for the simplest move and copy procedures, the new user will have to turn to the manual.

That boxed manual is somewhat taller than IBM's. Typeset and indexed, it isn't laid out in tutorial fashion, and, when it's not repetitive, it's often incomplete. The illustrations aren't bad, but there aren't enough of them, and examples of the var-

10 reasons why you should call DataSource[™] for micro software and hardware...

- 1. Software and Hardware for all Popular Microcomputers.** We carry software in all popular formats and operating systems including PC, DOS, Apple II, Macintosh and CFM-65. Always the current versions in stock.
- 2. Competitive Prices.** Our volume enables us to offer you prices which are consistently competitive. Compare for yourself, then call us for the best price.
- 3. Express Delivery.** Time is money and we at DataSource understand that. Your order will be processed and shipped within 24 hours for all products in stock.
- 4. Discount Structures.** We offer significant discounts to any individual, organization or user's group purchasing in quantity.
- 5. Key Account Program.** For corporations and institutions, we offer a comprehensive program volume discounts, complete maintenance support, and daily staffed technical support, a sales team experienced in micro applications, and more.
- 6. Risk-Free Software.** We stand behind every product we sell. All items are fully documented, backed by manufacturer's warranties and are guaranteed by DataSource to be in perfect working condition.
- 7. Toll-Free Technical Support.** We service what we sell. Our customers have direct access to our technical staff on a toll-free 800-328-4444.
- 8. National Maintenance Network.** We offer a variety of maintenance agreements tailored to the specific hardware items you select. Call for more information.
- 9. Flexible Payment Options.** We accept most major credit cards, checks and money orders. We also accept orders from approved corporate accounts.
- 10. Proven Track Record.** Join our growing list of customers which include many Fortune 500 companies, major educational institutions, and government agencies.

Here's a small sampling of products available now from DataSource
(If you don't see what you need, just call us at the number below.)

[illegible]

Fall Specials from Datasource™

Volkswagen - Lufthansa	\$120.00
Supercalc - Sorcim (IBMPC)	\$119.00
Memory Mail - North American	\$ 79.00

Only from Data Source:
 PC Utility Pack (Start Directory & Disk Clean-up)
 PC Consulting **\$99.00**
www.sony.com **\$14.95**

FOR MORE INFORMATION CALL TOLL-FREE

1-800-328-2260

IN MINNESOTA, CALL 612-544-3611

new hours: M-F 8-6, Sat 9-3 C

Prices reflect a 3 1/2% cash discount and are subject to change without notice. Purchase orders accepted from approved corporate accounts. All orders are shipped UPS. \$2 shipping charge on software items. 2% shipping charge on hardware items.

DATASOURCE
DATASOURCE SYSTEMS MARKETING CODE

Your source for micro software and hardware
1660 South Highway 100, Minneapolis, MN 55416

CIRCLE 217 ON READER SERVICE CARD

I DON'T
even want to think
about what I would
have to do to get my
unsupported IDS Prism
to underline text. That's
one more reason I'm not
writing this with
VisiWord.

lous features are few and far between.

VisiCorp. will be happy to sell you a book called VisiWord Word Processing for You and Your Business. It's published naturally, by VisiPress, and it includes a disclaimer nearly as long as IBM's. Written in humorless manuaesque, it offers some (but by no means all) of the step-by-step directions that should have been in the free documentation, along with arcane applications you will never use in your lifetime. At \$18.95, it's a shameless step backward in extracting extra cash from users and a tacit admission that VisiWord isn't really all that easy to use, after all. But VisiCalc and VisiFile users may need it too.

figure out how to VisiInterface with VisiWord. The VisiWord manual gives VisiCalc a scant page and a half. You have to print your Calc files to disk before you can read them into VisiWord. DIF files won't work.

Except for its information about sheets and start-up settings, the quick-reference card that comes with VisiWord doesn't provide as much information as the available help screens. A plastic overlay for the function keys is helpful once you manage to keep it from interfering with them.

Where to Put It

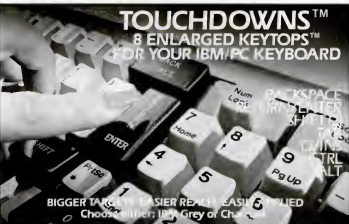
The 1.1 version of VisiWord can be installed on a fixed disk or on RAM disk by using a batch file provided on the disk. Unfortunately, you see performance improvements only when you move from the main menu to another menu and back again, which tends to be slow and noisy with a floppy. Editing speed will not improve one iota, since VisiWord loads the whole document and the text-editing module of the program into memory. And if you're thinking about diskcopying your RAM disk onto a floppy to make yourself a backup, think again. Using the copy will get you only an error message and a loud raspberry.

Though the documentation doesn't mention it, the VisiFolks inform me that VisiWord does not support the DOS 2.0 Path function. If you want to edit a document on hard disk, it has to be in the same subdirectory as the VisiWord files. This from a "new generation" program?

VisiCorp says it will give registered users updates of the program for \$20 each, but only one copy per customer. And if you're thinking of upgrading to VisiOn, you'll be charged \$50 or the difference between your version of the program and the VisiOn version, whichever is greater.

Goodbye Forever

Even leaving VisiWord is an exercise in frustration. Exit to DOS and you're prompted to Insert DOS disk in drive A. For some reason, the manual does not want you to put COMMAND.COM on the single-sided program disk to obviate the problem. Apparently, if you do, you may run out of room for some of the default files VisiWord creates. Strangely enough, I got COMMAND.COM to fit. Beats me. The VisiFolks inform me that, if you order the one backup disk to which you are entitled



TOUCHDOWNS™
8 ENLARGED KEYTOPS™
FOR YOUR IBM/PC KEYBOARD

BIGGER TACTILE EASIER REACH EASIER TYPED
 Choose either: IBM Grey or Charcoal

KEYTOPS (Design enhancements for the IBM/PC Keyboard)

Each Set: Only \$18.95 postpaid

IBM Grey ☐ Charcoal ☐ (AZ Residents add 5% sales tax)

NAME _____

ADDRESS _____

CITY/STATE/ZIP _____

WRITE CHECK OR MONEY ORDER TO HOOLEON COMPANY

VISA ☐ OR MASTERCARD ☐ GLADLY ACCEPTED

CARD # _____

EXP. DATE _____

SATISFACTION GUARANTEED OR MONEY CHEERFULLY REFUNDED!

CIRCLE 307 ON READER SERVICE CARD

HC

HOOLEON COMPANY

Post Office Box 1810P
 Cottonwood, Arizona 86326
 (602) 634-4503 • 634-4507

Dealer inquiries welcome

BancWare™

DECISION SUPPORT SOFTWARE FOR THE BANKING COMMUNITY

- Features loan computation / document preparation
- Computes commercial and monthly installment loan payments, pick-up, balloon, interest only...

- Computes complete disclosure statement

- Prints amortization schedules

- Automatically calculates fees, insurance

- Includes bank forms generator



FOR IBM PERSONAL COMPUTER, 128k 2 DRIVES

MCS™ Software

P.O. Box 17850, Salt Lake City, Utah 84117
 (801) 486-8746

DEVELOPERS OF BANCWARE

CIRCLE 287 ON READER SERVICE CARD

INTRODUCTORY
 OFFER
 \$1295

Computerisland presents a fantasy of low prices!

call us for information
on our complete
product line
and leasing plan

P.C. Boards

AST Research

- AST I/O Plus II clock calendar and serial port \$ 115
- Combo Plus 64K, upgradeable to 256K, with clock calendar, serial port and parallel ports 265
- Mega Plus 64K upgradeable to 256K (or to 512K with Mega Pak) with clock, calendar and serial port 285

Quadram

- 64K Quadboard, upgradeable to 256K, with Quadmaster software, clock calendar, serial and parallel port 277
- 64K Memory only 199
- 128K Memory 255
- 192K Memory 309

Monitors

Princeton

- RGB Hi Resolution \$499

NEC, Taxan,

- Sanyo, Amdek Call

Printers

Smith Corona

- TP1 \$Call

Star Micronics

- Gemini 10 339
- Gemini 16 479

Epson

- FX 80, MX & RX Series... Call

Okidata

- 82 A 440
- 83 A 690
- 84 P 975
- 92 P 545
- 93 P 970

Brother

- HR - 1 750
- HR - 15 570

NEC Spinwriter

- 7710 - 1 \$1,950
- 7715 - 1 2,100
- 7720 - 1 2,400
- 7725 - 1 2,400
- 7730 - 1 1,950
- 3510 1,350
- 3515 1,350
- 3550 1,850
- PC8023A 450

Disk Drives

5 1/4" Tandon Drives

- TM100-1A SSD 160K... 195
- TM100-2A DSD 320K... 275

Teac, Hitachi,

Matsushita

- Half Height Disk Drives... Call

Modems

Novation, Hayes,

Signalman,

- Cactus Call

Terms

MO. Cashier's Check. Personal checks allow 2 weeks for processing. Include Drivers License and credit card a Visa, Amex, C or add 3% service charge. Add 3% shipping & handling or \$2.50, whichever is greater. Add 10% for foreign orders or US Postal Post. Includes Telephone number. NO CODs. Prices subject to change without notice. Some items subject to prior sale. We reserve the right to substitute manufacturer. Retail prices may vary.

(for an extra 20 bucks), you may specify a double-sided one with room for such things as COMMAND.COM and AUTOEXEC.BAT files. Too bad there's no mention of it in the documentation.

Speaking of which, the Exit options include something called Start-another-product. This option, undocumented by

W^{HILE}

*VisiWord is looking
through your text at its
usual tortoiselike pace,
some sort of message to
fill the empty screen
might have been nice.*

the manual, turns out to perform the equivalent of a full three-key system reset—a major surprise if you happen to have files out on RAM disk. You can then report your loss to the Missing Files Bureau, which will shake its head sadly and tell you nothing can be done. This option, in a fit of VisiModesty, just happens to be the default; hit the Enter key and play "Wipeout."

I depend on my word processor every working day. I wouldn't be caught dead using a disk that's copy-protected, let alone one that's not write-protected, which is the situation here. And I have held a dozen custom-modified versions of WordStar for various specific tasks. With VisiWord's two-to-a-customer policy, that's impossible.

I don't have to think very hard to think of the many things VisiWord doesn't do—things like footnoting, indexing, multiple windows, and letting you insert nonprinting comments in a file. Enough said.

I'm still curious about VisiSpell, though. The program is distributed by VisiCorp but copyrighted by an outfit called "futheuristic" (now, I ask you, could I have made that one up?), and what I've seen so far looks promising. I'll let you know next month whether the promises turn sour. But when it comes to VisiWord, take the advice that often appears on its status line: "Please wait." /PC



Computerisland

23015 Del Lago Drive,
Ste. D2-161

Laguna Hills, CA 92653

714-951-0941

COINS and Coin Management System are two radically different software programs to manage coin collections for both the hobbyist and the investor.

Counting Your Coins

COINS

Compu-Quote
6914 Berquist Ave.
Canoga Park, CA 91307
(213) 348-3662

List Price: \$95; optional quarterly updates, \$25 each.

Requires: 64K, two disk drives, printer.

CIRCLE 791 ON READER SERVICE CARD

Coin Management System
Soft-Ray Systems
P.O. Box 70711
Sunnyvale, CA 94086
(408) 733-1938

List Price: \$75

Requires: 64K, one disk drive, printer optional.

CIRCLE 790 ON READER SERVICE CARD

When I started collecting coins as a kid, close to 20 years ago, my friends and I would mount bikes with a few dollars in our pockets and pedal down to the local banks. There, we'd trade in our dollar bills for rolls of pennies, nickels, or dimes—we usually didn't have the \$10 for a roll of quarters. Then we'd remount our bikes and head for a quiet spot, where we would go through the rolls looking for coins to

bolster our small collections. If we were lucky, a roll might yield two or three of the coins we needed. We'd replace the coins we took, rewrap them, write our names and addresses on the wrappers so we wouldn't get the same roll back another day, and head back to the banks to trade them in for more rolls.

Sometimes we'd travel to a coin dealer or coin show to fill in an empty spot in our albums, but that didn't happen often. Mostly, we counted on those rolls from the banks and whatever coins showed up in our hands as change from store purchases or from the school cafeteria.

Perhaps this was an unscientific way to build a collection. But in those days, collecting coins was just a hobby for us, not a profit-building investment that would enable us to buy a car, go to college, or even allow for a job-free, leisurely summer vacation.

Now I realize that numismatics is big business. Financial magazines and newspaper business pages carry ads from fiscal wizards advising readers to consider rare coins as investments. Their literature carries almost-too-good-to-be-true tales of how a particular coin quietly appreciated in its owner's safe deposit box.

The system that coin collectors use to keep track of their acquisitions has

changed, too. At one time, the collector evaluated each coin's condition, laboriously checked its value in a hobbyist publication or annual catalog, wrote the results on lined sheets of notebook paper, and systematically put each coin on a different page, according to its country of origin, denomination, year, value, condition, and so forth.

But now, in the age of the microcomputer, PC owners have a choice between two radically different software programs for inventorying and recording their coin collections.

Fill in the Blanks

COINS, which is an acronym for Computerized Inventory System, can be described as a fill-in-the-blank program that is best suited for those with rather standardized collections. If you specialize in ancient Greek and Roman coins, 20th century Canadian dimes, or even United States paper money, its benefits are limited. The strength of COINS is in its built-in market value file, which automatically calculates the value of any of 1,600 different coins, according to denomination, year, and condition. A quarterly update allows you to adjust the values in the market value file without having to individually alter the record of each coin.

COINS comes with one diskette and 28 pages of documentation. The current pamphlet, printed on yellow paper, is at first a

COINS IS oriented toward the collector or investor with a relatively standard collection.

bit distracting for IBM PC owners because of its references to the TRS-80 Models I and III, the computers for which the software was originally written. A new manual will be developed, according to COINS author Marvin Mallon, but, in the meantime, you get a two-page photocopied insert with step-by-step instructions on how to transfer DOS 1.10 and how to copy your COINS disk onto a back-up diskette. The insert also explains the use of the PC's F1 through F5 as dedicated function keys for the program. A plastic overlay card, which fits around the function keys, indicates the specific uses of the keys F1 through F5. The rest of the operation proceeds according to the instructions given for the TRS-80 models.

Only five pages of documentation explain how to run the menu-driven program, but that's enough to make most things clear. The menu includes six options (see Figure 1), starting with "Coin File Maintenance." The other options allow you to print reports on current value, purchases by year, sales by year, or a complete inventory, known as an "all entries report." Option 6 ends the program and closes all files.

Your Work Begins

With the first option, "Coin File Maintenance," you begin the tedious, repetitive process of entering each item in your collection. The query line at the bottom of the screen gives you four choices: (A)dd, to create a file; (C)hange, to alter an existing file; (I)nquire, to review a file; or (M)enu to return to the main menu. According to its manufacturer, Compu-Quote, COINS has the capacity to store approximately 10,000 records, provided you use two drives and

double-density, double-sided diskettes.

The file maintenance screen (see Figure 2) contains 14 fields, which appear on the screen as blank lines. To add a file, you fill in some of the blanks and others will be automatically filled in for you. Each coin is considered a separate record, and the program will automatically assign a record number when you add a new file. COINS prompts you to "Enter Standard Coin Number (0 If None)". Standard coin numbers are listed in the final 14 pages of the pamphlet for 1,600 different types of coins, including: Flying Eagle, Indian Head, and Lincoln cents since 1856; Liberty Head, Buffalo, and Jefferson nickels since 1863; Barber, Mercury Head, and Roosevelt dimes since 1892; Barber, Liberty, and Washington quarters since 1892; Liberty Seated, Barber, Liberty Walking, Franklin, and Kennedy half dollars since

1839; Morgan, Peace, and Eisenhower dollars; Susan B. Anthony dollars from 1878 to 1961. Accommodation is made for common variations. For example, there are separate numbers for both the small date and large date 1960D penny. Numbers are provided through 1990 to accommodate future updates, but if you enter standard coin number 1064, representing the 1990S Washington quarter, you'll get the face value of the coin, in this case, 25 cents.

The greatest weakness of COINS is immediately apparent if you have several coins of the same year and denomination in the same condition. Unfortunately, the program is incapable of repeating identical entries—you must reenter the same information for each such coin. As an alternative, you can use the description field to indicate how many of that particular coin you have, but the value calculation

Figure 1: The main menu of the COINS program.

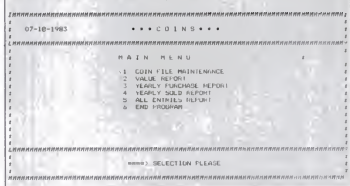
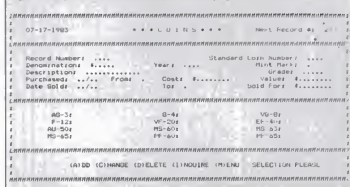


Figure 2: The file maintenance screen of the COINS program.



Coin-necting with Coin-puters

A closed-circuit telecommunications network for coin collectors, dealers, investors, advisers, and auctioneers.

Larry Brilliant, co-creator of the Complete Electronic Numismatic Trading System (CENTS), dreams of coin-necting the coin world through coin-puters. To begin to realize that dream, Brilliant and his partner, dealer-auctioneer Joseph Lepczyk, have created CoinTalk, an offshoot of CENTS, as the first closed-circuit programming telecommunications network, for collectors, dealers, investors, investment advisers, and auctioneers.

At the heart of the system is an Amdahl mainframe, housed at Wayne State University, in Detroit, Michigan. Brilliant and Lepczyk hope that the system will become an international network of IBM PCs and XT's. The PCs and XT's are linked by a telecommunications protocol, which gives subscribers what Brilliant describes as "one-button access" to the mainframe from their micros.

"It's the first attempt to computerize the market. There's enormous potential for computerizing the industry and taking advantage of the popularity of the PC," explained Brilliant. He said the concept for CENTS evolved from his past efforts with the World Health Organization to set up national disease systems to monitor smallpox and blindness in foreign countries.

CENTS is a product of MarketNet Technologies, Inc., which can be contacted at Box 860, East Lansing, MI 48823, telephone (517) 332-8841 or (800) 523-2445. Its potential market is huge: an estimated 10 million coin collectors, at least 170,000 of whom are serious enough about their hobby to subscribe to a weekly trade publication; 20,000 dealers; 300 major auction companies; and 100 to 200 investment advisory groups with 20 to 500 clients each. The system's initial capacity is 960 dealers and somewhat over 10,000

collectors, according to Brilliant.

The firm is in the process of making four basic software packages available. Bundled with the software are a modified computer conferencing system designed by Robert Pernes, and IBM or IBM-compatible hardware. Some of the software packages are now available, with the rest scheduled for release in 1984. As part of the bundling, MarketNet Technologies can make arrangements for subscribers to lease micros and printers from Huron Leasing Company, of Chicago, and is negotiating with IBM to become a value-added retailer. The firm recommends the PC for collectors with fewer than 1,000 coins and for dealers with less than 1,000 clients, and suggests the XT for those with larger collections and dealerships. All four software packages will include a built-in Hayes 1200-baud Smartmodem and a communications protocol for access to the CoinTalk network. Also available will be optional software such as spreadsheets and word processing programs for dealers and auctioneers.

CollectorPoc is aimed at the individual hobbyist and includes the capability to inventory a collection, add new coins and delete those sold, prepare reports, and update values through the network. InvestorPoc, a more sophisticated version of the collector package, is aimed at those who are into numismatics primarily to make money. DealerPoc is more advanced: It can manage inventories, handle customer want lists, prepare camera-ready catalogs, print statements, manage client records, and even produce the necessary forms for reporting bullion transactions to the Internal Revenue Service. The final package, AuctionPoc, will add other capabilities to the dealer package, including maintenance of bidder files, printing of bid

books, and computer-matching of high bidders to lot numbers.

A subscription to CoinTalk provides a way to electronically advertise, buy, sell, or competitively bid on coins. In addition to maintaining current market values for American and foreign coins, it also makes available spot gold prices, updated every 15 minutes. Brilliant describes it as an "electronically simulated bourse." Instead of physically entering a hotel or convention center for a coin show, all registration, browsing, begging, purchasing, and even billing is done over the network. For instance, if you're interested in buying or selling an 1880 Morgan silver dollar after signing on, you type either the category 42E or the word dollars and then type in the year. You'll get every 1880 Morgan available for sale from any subscriber, or wanted by any subscriber, together with the coin's catalog value and how many were minted. A prospective purchaser simply types in Buy to send the message to the offering dealer; the dealer in turn uses the system to send a computerized invoice confirming the deal.

The system could have a major impact on the way coins are bought and sold. When a customer comes to a dealer with a particular coin for sale, the coin can be advertised on CoinTalk in a matter of seconds. According to Brilliant, this means dealers will be able to buy more coins and turn them over for a quicker but smaller profit. With that kind of liquidity, "the whole market will benefit," he said.

With the CoinTalk system as a prototype, the generic concept of closed-circuit programming linking a mainframe and micros can be expanded, Brilliant says. Next on the agenda is something he calls JobTalk to help match employers and job hunters.

—E.F.

tion from the market price database will be based on a single coin, unless you use 0 as the standard coin number, then enter their combined value.

As you proceed through the file maintenance screen, you can leave blank any of the fields, except the grade field, simply by hitting the enter key. You also can delete or change any default response. Function keys F1 through F5 are used to change or clear fields, abort an entry, or automatically enter the face value as the purchase price of coins you found in circulation.

The market values provided by COINS have been calculated based on published dealer prices, catalog and magazine price lists, and auction prices. If the grade you chose doesn't have a current market value listed, \$1 will appear, and you can enter your own value after pressing C, which permits changes. Or, if you disagree with a value supplied by the database, you can change it. Press Return after the value appears; the screen will flash "Record is Added" as confirmation.

The cursor does not automatically move to the final three fields for sale date, buyer, and sale price. To fill in information in these fields, you must again press C for change.

What if your collection includes foreign or American nonstandard items? You may own, for instance, some colonial coins, an 1804 half cent, a few mint errors, three silver certificates, and a 1925 Stone Mountain 50-cent commemorative coin. If this is the case, enter 0 as the coin number, then fill in each field individually, including value. COINS will inventory them, but provides no value from its own database. Also, the quarterly updates will not alter the values you've entered for coins with standard number 0. So, you must obtain current estimates of the value of those items from other sources, such as hobby publications or dealers.

The Easy Part

After the date is all entered, the easy part begins: report generation. The most comprehensive listing available is Option 5, the "all entries report." This report provides a printout, arranged by denomination and year, of every coin in the file, including those that have been sold.

You may also choose to print reports by current value, by coins sold in any year, or by items purchased in any year. With Options 2, 3, and 4, you can break your

Figure 3. A value report generated by COINS. The program will automatically print the percentage gain or loss.

*** VALUE REPORT ***									
As of 07-18-1985									
Rec#	Stk#	Denom.	Year	M	Description	Grade	Cost	Value	Pct. %
155	1229	\$0.50	1907	S	BANKER	G-4	2.00	4.05	+102.5
156	1249	\$0.50	1911	S	BANKER	G-4	1.25	3.80	+204.0
154	1268	\$0.50	1917	S	L.B.WALF	VB-8	0.50	7.00	+1300.0
160	1273	\$0.50	1918	S	L.B.WALF	G-4	0.50	5.80	+1060.0
158	1277	\$0.50	1920	S	L.B.WALF	G-4	0.50	5.80	+1060.0
161	1292	\$0.50	1935	S	L.B.WALF	VB-8	0.50	7.00	+1300.0
157	1299	\$0.50	1937	D	L.B.WALF	G-4	0.50	5.80	+1060.0
159	1316	\$0.50	1943	S	L.B.WALF	VB-8	0.50	7.00	+1300.0
246	1328	\$0.50	1948	F	FLN MS-63+67	MS-65	31.50	79.00	+150.8
247	1329	\$0.50	1948	D	FLN MS-63+67	MS-65	31.50	54.00	+71.4
177	1352	\$0.50	1958	D	FRANKLIN	EF-40	0.50	6.25	+1150.0
#5.50							\$69.75	\$186.30	+167.1
*** END OF REPORT ***									

report down by denomination, or include your full collection. If, for example, you're seeking buy or sell information for a year

ONE DRAWBACK in CMS is that, as you enter information, the list of mint marks and grades does not appear on your monitor.

when there were no such transactions, your report will tell you, "There were no sales in 1983" or "There were no purchases in 1981." In each report, the percentage gain or loss in value is automatically calculated and printed, provided both the acquisition cost and current value fields are filled in (see Figure 3). If collecting coins is an investment for you, this information is useful in determining the appropriate selling time. The annual reports on sales are useful for determining capital gains for income tax purposes.

One limitation on the reports is that you can't print a report based solely on the description field. For example, you can use the description field to indicate which coins are kept in your bank vault by typing in bank, but you can't generate a report restricted to those coins. According to Mallon, such an idea was considered, but rejected because most collectors wouldn't need it.

The documentation states that a print-

er is necessary for COINS because, as Compu-Quote puts it, "There is too much information to portray clearly on the screen." When you generate a report, all you get is the hard copy. The screen flashes status messages such as, "now reading all records," "now sorting all records," and "now printing," but the actual report won't appear on your monitor. When the printing is complete, the main menu reappears on the screen.

A Different Approach

The second program, Coin Management System (CMS), takes a different approach and requires more programming skills. It is essentially a storage and retrieval program and does not include a database of market values. Soft-Ray, its manufacturer, says about 4,000 records will fit on a double-sided, double-density diskette.

Its great strength is its flexibility. While COINS is oriented toward the collector or investor with a relatively standard collection, CMS allows you to set up your own data files by coin group, mint mark, and grade. The sample files on the CMS diskette include ten coin groups (which are listed in Figure 4), six mint marks, and twelve coin grades, but you can set up as many as twenty files in each of the three categories. You must erase the sample data files from your diskette and use EDLIN to create your own. The CMS documentation describes the recommended format for your files, but refers you to the PC-DOS manual for information on how to use EDLIN.

After your program disk is prepared by formatting, entering the appropriate DOS commands, and copying the program from the original CMS diskette, you enter

Figure 4. The screen in CMS for adding a new record. The ten coin groups are also listed.

Add a New Record -- 1. Coin Group..... 2. Year & Mint [YYYYMM].. 3. Grade..... 4. Purchase Price..... 5. Date Purchased [YYYYMM].. 6. Current Value..... 7. Valuation Year [YY].. 8. Comments.....	-- Coin Groups -- 1. Buffalo Nickel 2. Jefferson Nickel 3. Franklin Halves 4. Anthony Dollar 5. Eisenhower Dollar 6. U.S. Mint Set 7. U.S. Proof Set 8. Commemoratives 9. Bahamas Coins 10. Miscellaneous
--	---

Figure 5. CMS can generate a high-value report, listing your collection in descending value.

07-20-1983		HIGH VALUE REPORT				PAGE 1	
		U.S. Mint Set					
		PURCHASE				VALUATION	
YEAR	COMMENTS	GRADE	DATE	LOST	YEAR	VALUE	
1970	Sm. Date	MS65	70/12	8.00	83	52.00	
1970	Lg. Date	MS65	70/05	11.00	83	31.50	
1967		MS65	67/11	3.00	83	13.00	
1966		MS65	66/10	3.00	83	5.35	

RUNCMS to initialize the program and get the coin editor menu on your screen. You have six options: adding, changing records, deleting records, calling the utility, calling report menus, or exiting.

To add a record (see Figure 4), you input the coin group, mint mark, and grade based on the files you've created, as well as the year, purchase price and date, current value, and valuation year. There is also a field for comments. As with COINS, there's no quantity field and, thus, no easy way to track holdings of multiple coins in the same condition and denomination. However, you can use the Comments field for such a notation and can enter the combined worth of the multiple coins for current value.

Because CMS offers no database with market values, you've got to obtain that information elsewhere and enter it. And there is no way to automatically update those values. According to Raymond C. Whismar, author of CMS, a market value database is unnecessary because the value of most coins doesn't change in the course of 1 year.

One drawback in CMS is that, as you enter information, the list of mint marks and grades does not appear on your monitor. If you forget that D represents a Denver mint mark or that S represents an Extra Fine 40 grade, the program prompts you to enter H for Help, bringing the appropriate directory to the right side of your screen.

When you've completed the date entry for a coin, you're asked, "Do you want to save this transaction (Y/N)?"

More Things to Do

Records can be edited under Option 2 of the main menu by changing information in any of the fields. You will be asked if you want to save the new date before the old date is replaced. Option 3 allows you to delete a record. When you select the delete function, CMS will search the files based on any of the eight information fields you specify. When a matching entry is found, you'll be asked, "Is this the right one?" to prevent deletion of the wrong record. If you press N, the search will be continued.

The CMS utility menu allows you to search, display, change or delete records, print or pack the master file, and call the editor or report menus to the screen. You can search by any field, including Comments, an advantage if you used that field to indicate which items are in the bank or which are rolls of coins.

You can generate a variety of reports, and, unlike with COINS, you have a choice of printing them (parallel printer only, according to Soft-Ray) or having them appear on the monitor. To avoid lengthy lists flashing before your eyes, when a screen is full you're told to "hit any character to continue report, ESC key to exit."

With either system, it's a good idea to print out a complete inventory and store it in a safe place for insurance purposes. CMS can produce a number of specific reports. A "variance report" will compare purchase price with current value, giving both the variance by coin and the total positive and negative variance for all items selected. A "high-value report" will list the items in your collection in descending value, with either acquisition price or present value as the basis, depending on which you choose to generate (see Figure 5). If you're in the market to fill in the gaps in your coin collection, you can produce a "want list" by creating records on items you need, giving 0 as the purchase date or purchase price. The want list is printed in compressed type, which makes it easier to carry around to coin shops and dealers. You also can produce lists according to coin group end to time period, given in years.

Flipping a Coin?

A decision on which of the programs to buy shouldn't be made by a simple flip of a coin. The philosophies behind COINS and

THE WANT LIST is printed in compressed type, which makes it easier to carry around to coin shops and dealers.

CMS are different, but both can help you keep track of your coin collection. You should consider the strengths and weaknesses of each system, coupled with your own skills, the size and nature of your collection, and your willingness to spend time researching market values. Given my predominantly standard collection, COINS is the sensible choice for me. But if your collection is more specialized, and you are willing to spend the time to periodically check on the value of individual items, CMS may be the program for you. For the dabber in numismatics or for the bobbyist with small collections with little turnover, maybe neither COINS nor CMS is necessary. /PC

announcing **THE INSIDER™!**

A 10 Mega-byte Internal Hard Disk Drive System...

Only **\$995!**



Expand your IBM® PC so that it performs like the PC XT for a fraction of the cost.

Micro Design International announces a major breakthrough in peripheral technology — The Insider™! It is the only hard disk drive system to offer you 10 Mega-bytes of formatted capacity with complete internal installation, all for \$995. Now you can expand your IBM® PC to handle heavyweight data with the same ease and efficiency as the PC XT. By equipping your PC with The Insider™ you can save up to \$2,000 over the cost of a PC XT. It's the perfect solution to your data needs and budget.

The Insider's™ engineering is far superior to any other hard disk drive system on the market. Unlike other internal drives which require an external power supply, The Insider™ uses available power. In fact, it uses only 0.9 A of direct current thereby eliminating overheating, a problem which has plagued other drives. Our drive and electronics are so good that we carry a full one year warranty.

The Insider's™ low price of \$995 includes complete software with all needed utilities; a Sandstar™ Hard Disk Controller Card which has expansion slots for other SandStar™ Modules; complete cables and simple instructions for easy installation.

The Insider is also compatible with most IBM PC look alikes.

CIRCLE 608 ON READER SERVICE CARD

To expand your PC to the performance of a PC XT at a fraction of the cost, **CALL TODAY** to order The Insider™. MasterCard and Visa are accepted; or, send check or money order to Micro Design International.

**TO ORDER
CALL COLLECT 305/788-3475**

Micro Design International, Inc.
Suite 375
100 Sybella Ave.
Maitland, Florida 32751

* IBM is a trademark of the International Business Machines Corporation.

** Sandstar™ is a registered trademark of Maynard Electronics.

† Registered in the U.S. Patent Office.

Printers are the most common source of grief for PC users because they require so much attention, not to mention system resources. The Printer Optimizer can help make them more self-sufficient.

Obedience Training For Your Printer

Printer Optimizer

Applied Creative Technology, Inc.
2733 Avenue E East
Arlington, TX 76011
(817) 261-6905

List Price: \$499 (800) 433-5373

The first hint that the Printer Optimizer differs from most mortal printer buffers is a 16-button keypad lurking among the few controls and indicators on its front panel. Keypads are normally used for data entry, and the presence of one on the front panel implies that something inside can handle such data. In fact, the Optimizer has a built-in Z80 microprocessor. In other words, the tiny tin box of the Optimizer houses its own powerful computer. A three-character alphanumeric light-emitting diode (LED) display, a "Pause" pushbutton, and a red "Power On" LED complete the front panel controls.

The Optimizer includes two jacks on the back for Centronics-compatible parallel data input and output. An optional "Opticom" card adds extensive serial input and/or output capabilities in the form of two additional RS-232C ports. (Al-

though the board is normally factory installed, field installation involves little more than plugging it into one connector and twisting four screws.) An on/off rocker switch and a recessed reset pushbutton complete the back.

Installing the optimizer and getting it to communicate properly with both your computer and printer requires removal of the top of the unit (two screws) and setting anywhere from one DIP switch bank (for Centronics parallel communications only) to four, for serial communications. The

latter may also require rearranging several jumper wires on the Opticom card.

The instruction manual endeavors to explain all the mysteries of serial connections. However, the manufacturer's toll-free number, which, when not busy, gives you direct contact to an understanding human being, willing to talk you through the most perplexing installation process, is likely to be more helpful.

With the Opticom module installed, the Optimizer is a regular chatterbox. It will convert a parallel input to a serial out-



Printer Optimizer, showing 16-button keypad, 3-character LED display, "Power On" light, and Pause button.

dBASE and dBASE WINDOW NEW! DOOR

PRODUCTS FOR THE FUTURE— AVAILABLE NOW!

dBASE WINDOW is a full-fledged dBASE II Application Generator. Working from your design, dBASE WINDOW generates and runs record keeping applications of all kinds, quickly and effectively. Just draw your input screen and report formats and dBASE WINDOW will create your application for you.

dBASE DOOR is a new product for those who only require the report generating capability of dBASE WINDOW. dBASE DOOR can be used with existing dBASE II command files and databases, providing the most powerful report generation available for dBASE II. If you own QUICKCODE or AUTOCODE, you need dBASE DOOR!

dBASE WINDOW and dBASE DOOR have the unique capability to build upon a relation between two independent databases. Here's how:

Job Records				
ADDRESS	FIRST NAME	LAST NAME	EMPLOYEE NUMBER	DEPARTMENT NUMBER

Personal Records

Any two databases can be linked by a common field. In this example, the field 'last name' establishes a relationship between the personal records file and the job records file. Using dBASE WINDOW or dBASE DOOR, you may now print reports which contain data from both databases!

Compare the features of dBASE WINDOW with any program generator:

- Any number of databases may be present in an application
- Up to five indexes per database
- Real time interactive queries
- Built-in powerful free-form report generator, also available separately as dBASE DOOR
- Uses two databases in one report
- Easy to add custom code when necessary to meet special needs.

Requirements: CP/M® and dBASE II 2.3B; CP/M-86® or PC-DOS and dBASE II 2.3D. Disk space required for dBASE WINDOW: 400K or more.

dBASE WINDOW is \$249, dBASE DOOR is \$149, either manual only \$20 (manual price will be credited toward future purchase of program).

Tylog



Tylog Systems, Inc., 9805 S.W. 152 Terrace, Dept. pc, Miami, Florida 33157 (305) 253-5942
To Order: Call today or send check, full name and address, telephone number and disk format. Credit card buyers send card number and expiration date. We accept COD, VISA, Mastercard and prepaid mail orders. Add \$5.00 shipping except for prepaid mail order for program. Florida residents add 5% sales tax.

dBASE II is a trademark of Ashton Tate. CP/M® and CP/M-86® are registered trademarks of Digital Research, Inc. Quickcode and Autocode are trademarks of Fox & Galter and Stemmos Ltd.

Dealer and Distributor Inquiries Invited.

MasterCard and Visa accepted.

CIRCLE 435 ON READER SERVICE CARD

put (and vice versa), or keep things parallel-to-parallel or serial-to-serial. The serial ports will digest and regurgitate any standard baud rate from 110 to 9600 with nearly any protocol (parity, word length, number of stop bits) and handshaking (hardware, ETX/ACK, XON/XOFF, etc.)—and input and output need not be the same. So not only can you get the Optimizer to communicate with almost anything with an RS-232 port, but even adapt a parallel output to a serial printer, or a serial output to a Centronics parallel printer.

THE MANUAL

*was understandable—
nay, a joy to read.*

Low-voltage power to operate the Optimizer is supplied by a black transformer that plugs directly into a wall outlet and is permanently wired to the Optimizer main chassis. When plugged in and turned on, the Optimizer runs through a diagnostic program that checks its health in a few seconds. If the Optimizer finds itself fit, it cheerily beeps once and displays the amount of memory available on its front panel LED display in 1024 byte increments.

I must admit I was virtually won over to the Optimizer almost before I pulled the machine out of its box and surveyed all the mechanical details. Quite by accident, I started to read the instruction manual before trying out the actual machine. I was shocked! The manual was understandable—nay, a joy to read. It made sense, was informative, and at times even delightful. It was perhaps the first manual that I did not have to put off reading until I got a Ph.D. in electrical engineering.

Control Functions

The Optimizer promises three big benefits to anyone who has both computer and printer: enhanced print spooling; direct printer control; and protocol, character, and string conversion. Connecting the Optimizer essentially puts another computer between your PC and your printer. In fact, the Optimizer can be hooked up between a PC and three printers. And, like any computer, the Optimizer can be programmed to act in particular

ways upon recognizing certain codes or conditions.

The computer control functions of the Optimizer are of two types, or "modes" as they're called in the manual. The first mode, 100, sends commands directly to the printer when you press the proper combination of buttons on the front panel. Mode 200 causes the Optimizer to monitor the line to the printer and, upon recognizing a preset character or string of characters, to send other characters or commands to the printer.

Some examples may make these concepts clearer. In mode 100, you may command the printer to switch character sizes or spacings, tabs, line spacings or character fonts. It can also direct the printer to print headings or your favorite graphics.

In mode 200, you can command the Optimizer to change every letter in your document into an asterisk. Th* imm*diat* r*sult would look som*thing lik* this. The real value of the Optimizer, however, is its ability to turn certain character combinations into control codes.

WITH THE Opticom module installed, the Optimizer is a regular chatterbox.

Control codes are those mysterious symbols that your printer manual tells you will elicit special functions—line feeds, alternate character pitches, and the like—from your printer. Usually, the most direct access to the control codes is the BASIC instruction, CHR\$(n), which can be difficult to access in the middle of most word processing programs.

With the Optimizer, however, you can program the character combination [J] to mean "compressed print." When you type [J] into your document, the Optimizer decipher the characters and sends the appropriate code to your printer.

Further, you can dispatch any string of up to 127 printable or control characters to your printer on command. Once you become familiar with the workings of the Optimizer, you can even send graphics (for example, your company logo) in the middle of a lengthy text.

Programming is simple. Press a few buttons to enter the proper mode; then punch in an equation. The LED display identifies the buttons you've pressed, and a "clear" key gives you a second (and third) chance if you make a mistake.

In mode 100, you first enter a "slot" number (which is the number you will later press to elicit the response characters), an equal sign (=), and the response characters or control codes (in decimal ASCII) that you would like the Optimizer to send to the printer.

When using mode 200, you punch in the decimal ASCII value of the characters you want the Optimizer to recognize, an equal sign, and the characters you want sent to your printer, when the recognized characters appear. Or you can program a character or string of characters to trigger the Optimizer to send the contents of a slot to the printer.

The Optimizer permits you to store commands in up to 99 mode 100 slots, or a maximum of 127 characters per slot, and mode 200 equations, at up to 127 characters per equation, to a total of 2,000 ASCII characters. This programming information is stored in a "housekeeping" memory that is kept nonvolatile (it won't disappear when the power is turned off) by a lithium battery inside the Optimizer.

The Optimizer also has three other modes. Mode 300 allows the downloading of mode 100 and 200 information through a word processing program. Thus, instead of entering the ASCII code numbers on the keypad, all you need to do is type the information into your PC. Mode 400 prints out the contents of the housekeeping memory, and Mode 500 allows you to make up to 99 copies of documents stored in the Optimizer's buffer memory.

Enhanced Spooling

The longest minutes in all of personal computing are those that stretch between the start-up of a print sequence and the conclusion, when the last form feed slides the final sheet of paper out of your printer. Too often, a printing session is an endurance test that wears you down as it supplies you with copy. While you itch to enter more data, the screen stares blankly and unyieldingly back at you.

Many word processors allow simultaneous printing and editing. But many are like my version of WordStar. They allow you to enter text while printing as long as

For Seeds...
it's Burpee

For Clothes...
it's L.L. Bean

For Gifts...
it's Horchow

and
For Software...

it's Strictly
Soft
Ware



If you're tired of guessing about what the software does—and when it will arrive—let us help. Our free, industry-leading catalog is crammed with information about our full line of software, offered at sensational prices. Write us and find out why Strictly Soft Ware is the mail-order leader in price, support, and delivery.

Your Corporate Software Connection

Our National Accounts Program provides special discounts for large volume purchases. Call for details.

Strictly Soft Ware 1-800-848-5253

To receive your free catalog right away, send this coupon to the address below. Do you want ☐ Apple or ☐ IBM Catalog?

NAME _____

STREET _____

CITY _____

STATE _____

ZIP _____

() PHONE _____

Strictly Soft Ware
P.O. Box 338
Greenfield, OH 43023
Orders: 1-800-848-5253
In Ohio & Technical
Assistance: 1-614-587-2036



PC

CIRCLE 434 ON READER SERVICE CARD

you don't object to interminable delays (enforced by a WAIT message at the top of the screen) between keystrokes.

The print spooler or printer buffer is supposed to be the solution to this problem. In theory, the computer dumps all your precious electronic words into the buffer within seconds and frees the com-

puter for other chores. The spooler slowly unwinds your words into the printer. At heart, the Printer Optimizer is a sophisticated print spooler. However, it starts where many other spoolers leave off. Its minimum memory capacity is 64K, the maximum of many lesser units. Additional memory boards expand the Optimizer's

capacity to 256K in 64K increments.

Although hundreds of thousands of "K" may seem like more memory than you'll ever need, the first time you use a small spooler you'll quickly learn how fast memory fills up. Even though the file you want to print may contain only 30K or so of data (the typical length for a story in this magazine), the file may swell to double that size once the word processor has added formatting and other control commands for the printer. Pretty soon, you're tripping on the edges of the spooler's capacity. A small spooler will allow normal editing between the times that it's filling up the buffer, but miniscule memories cannot give many of the added features

PerFin, your personal money manager.



It's impossible to plan for tomorrow unless you know what you're spending today.

PerFin, the personal financial program for the IBM-PC, helps you analyze spending patterns through a comprehensive, yet easy-to-use method of record-keeping. Priced at only \$65*, PerFin is the most inexpensive, effective resource available for personal money management.

With PerFin, you can track all your expenses in up to 40 user-defined categories, creating permanent records by month and category. And that information becomes the basis for realistic goal-setting with PerFin's budget feature.

You can request year-to-date reports by category, or ask PerFin to alert you when you're over-budget.

You can also use PerFin to balance your checkbook—quickly and accurately. Provide comprehensive reports for income tax purposes. Edit, delete, or rearrange entries. Whatever your financial goals, PerFin is a proven tool that can help turn them into reality.

To order, phone (713) 531-6100 or write DEG software.

*Plus \$3 postage and handling.

DEG software

(713) 531-6100
11999 Katy Freeway, Suite 150
Houston, Texas 77079

THE OPTIMIZER *is a sophisticated print spooler that starts where others leave off.*

that are second nature to the Optimizer.

Note, however, that even with a huge spooler, the world is not all roses. If you decide to use the Optimizer in its optional serial mode, you'll soon discover how slow its 9600 baud speed limit can be. You can't just press "Print" and keep on computing. Dumping 64K data into the spooler, ignoring disk access time, requires about a minute at 9600 baud time. Worse yet, your word processor probably won't just dump your megamop opus into the printer. It takes considerable time to think up its strategy for formatting each sheet and issuing proper control codes to the printer (for character spacing and the like). Even with an allegedly high-speed parallel output, dumping a long file into the printer can take several minutes.

Certainly, you'll save time with any spooler, particularly if you are cursed with a 12-character-per-second daisy-wheel printer. But, in any case, the spooling process is not instantaneous.

Print spooling, however, was not designed merely to save time. It also allows you to keep your printer and computer in separate rooms. By piling documents into the Optimizer (or nearly any spooler), you can use the printer at your leisure. The LED display on the front panel of the Opti-



RESTON INTRODUCES MICRO LEARNING SYSTEMS™



IBM™ and IBM Personal Computer™ are trademarks of International Business Machines Corporation.
Micro Learning Systems™ is a registered trademark of Reston Publishing.

You can't learn to fly a plane just by reading about it. The same goes for using your personal computer. That's why Micro Learning Systems™ created a new series of microcomputer training programs, the Teach™ series. They're interactive, computer-based programs that teach you to use your computer ON your computer. Each program is your private teacher, guiding you through a series of customized, self-paced lessons. Graphic displays make learning easy, and the source material becomes your reference for years to come. Micro Learning Systems™ training programs make complex hardware and software truly "user-friendly". You'll save time and money learning how to get the most out of your microcomputer investment—the easy way—with Micro Learning Systems training.

Micro Learning Systems presents for the IBM Personal Computer™:

The IBM™ Teach Program
The VISICALC Teach Program
The BASIC Teach Program

Reston Software™

A Prentice-Hall Company -
11480 Sunset Hills Road
Reston, Virginia 22090

Available at local computer and software stores or order directly from Reston at (800) 336-0338

CIRCLE 600 ON READER SERVICE CARD

mizer indicates remaining memory available as the Optimizer consumes RAM.

When you're standing in another room, away from the keyboard of your PC, the added capabilities of the Printer Optimizer become apparent. For instance, if your word processor doesn't provide for pauses between documents, you can use Mode 200 to program the optimizer to recognize any particular combination of characters as a pause command. Just be careful that you don't choose anything that may appear as text in the middle of an actual document. Should you run into problems during the printing session, the Pause control on the Optimizer front panel will enable you to quickly shut down the printer. Likewise, by adding one or two extra characters at the end of each document, you can make the Optimizer add a form feed to put blank sheets between different documents printed in a series. Mode 500 will let you print multiple copies without reprogramming instruction after instruction into your PC. Further, you can deliver ten items to the printer in any order and

program the optimizer to deliver them in a different order. You can also print text, spreadsheets, and graphs in a single output.

***EVEN WITH
an allegedly high-speed
parallel output,
dumping a long file into
the printer can take
several minutes.***

Now that I've raved about how wonderful the Optimizer is, I'll rant about its problems and shortcomings and consider whether you actually need this little miracle in a box.

If you're thinking of purchasing a Printer Optimizer, your main consider-

ation should be its compatibility with the software and hardware that you already have. Although the extremely flexible optional serial inputs and outputs of the Optimizer can be set to make it receive data from well nigh anything—and send data to nearly anything else—things still can go wrong. In my brief tryout of the Optimizer, I experienced some of its shortcomings.

Once upon a time, dimly aware of some of the problems inherent in WordStar, I invested in one of the latter-quality printers that WordStar claims to support fully. In other words, I bought a printer whose special features could be controlled by my software. My marginally astute choice of printer/computer combination meant that I wouldn't have to worry about sending extra control codes to my printer, at least during word processing. Consequently, for me, the Optimizer offers no new advantage in this regard.

Moreover, it turns out that WordStar and the Printer Optimizer are often at odds. Although it might seem like a neat

Low-cost Interface DiskSystems[®] for IBM PC-2.0 DOS



- 10, 15, 25 megabyte models available now!
- DiskSystem includes Winchester disk drive, cabinet, power supply, cable, controller, I/O adapter and device driver ■ Fully compatible with 2.0 DOS (unmodified) ■ Exclusive double shock isolation system ■ Standard warranty includes 90 days parts and labor
- 10 megabytes formatted storage \$1695
- 15 megabytes formatted storage \$2295
- 25 megabytes formatted storage \$2995
- 5 1/4" Winchester Backup or Additional Storage For IBM PC XT or IBM PC DiskSystem
- Slave compatible with 2.0 DOS
- 10 megabyte formatted storage \$1425
- 15 megabyte formatted storage \$1645
- 25 megabyte formatted storage \$2295

Dealer Inquiries Invited

I² INTERFACE INC

7630 Alabama Avenue
Canoga Park, CA 91304
(213) 341-7914 Telex: 662949

IBM is a registered trademark of IBM Corporation.
DiskSystems is a copyright of Interface Inc.

Prices are suggested retail and subject to change without notice.
© 1983 Interface Inc.

CIRCLE 354 ON READER SERVICE CARD

idea to be able to change character sets, page sizes, and the like at the printer by pressing a couple buttons on the Optimizer, WordStar can't be outsmarted. It embeds its own commands to override the ones I program into the Optimizer. Of course, with the Optimizer you can effectively erase the commands that the software sends; but then those special features become inaccessible even when you want to elicit them through the software.

Sometimes the results of using the Optimizer are surprising. My printer picks up speed by printing bidirectionally under command from my word processing program. This means that alternate lines are sent to the printer with the characters in reverse order. The Optimizer does not recognize a string that is sent to it backwards. However, it will recognize a single character used as a command, even if it's embedded in a reverse line. If the printer is in reverse when a character command appears, the string from the Optimizer is printed backwards. Every dog turns into a god and PC Magozine transforms into eni-zogom CP.

My software also sends out character-spacing commands based on what is stored in the computer memory, and cannot take into consideration what has been programmed into the Optimizer. When a single character, or character string, from the computer causes the Optimizer to send several characters to the printer, the consequences can be unpredictable. Sometimes everything works out fine; other times letters are spread across the page in seemingly random fashion.

If you think about how the Optimizer works, and you know what goes on inside your software, all these problems may be predictable, but the otherwise extraordinary manual gives the less informed among us no hint of some of the unexpected consequences that can result.

WordStar also presents problems in mode 300, downloading into the Optimizer's housekeeping memory. The Optimizer refused to react to anything that WordStar told it to remember. However, sending the same file using a print command instead of the word processing program worked fine.

This does not mean that there are design problems with the Optimizer. As far as I can tell, there are no major flaws. The small disasters I ran into only illustrate that the computer world is still non-

standard and that you cannot always expect every piece of hardware or software to operate in harmony with every other place. It's still a good idea to try before you buy.

THE *Optimizer saves you from the frustration of having a single-minded computer that will do only one thing at a time.*

The only other shortcoming of the Optimizer I encountered is the location of the Reset button on its back panel. Certainly, a control that vaporizes everything in the unit's memory needs to be kept out

of harm's way, but normal operation of the Optimizer often requires pushing this button. To prevent surprises, it must be pressed before entering Mode 500, for instance. Then it's grip and grope, feel and fumble time. Surely this control could be relocated to a more convenient position—to the front panel, perhaps. For safety, the Reset could require pressing two buttons simultaneously.

Nearly any accessory you can buy for your IBM PC claims to save you time and money. The Optimizer saves you something even more valuable; it saves you from frustration, the frustration of having a single-minded computer that will do only one thing at a time, the frustration of software that believes words and graphics mix about as well as oil and water, and the frustration of software and a printer that require a séance to speak to one another. Although the Printer Optimizer's primary benefit is convenience, it can also add new capabilities to your PC system and help you make better use of those you already have. /PC

For Those Who Seek.

Bible study aids from Bible Research

Systems include the complete KJV Bible text on disks. THE WORD processor can search the Scriptures for any word or phrase. Any portion of the Bible can be printed or displayed. Create your own library of research materials or use ours, called TOPICS.

TOPICS contains cross-reference indexes on over 200 of the primary subjects discussed in Scripture.



Bible Research Systems applies computer technology to personal study of the Scriptures.

TOPICS
\$49.95

Bible Research Systems
9415 Burnet, Suite 208
Austin, TX 78758
(512) 835-7981

THE WORD
processor
\$199.95
Plus \$3 postage/handling

Requires APPLE II+, IBM-PC, TRS80-III, OSBORNE, KAYPRO, or CPM 8"

CIRCLE 156 ON READER SERVICE CARD

PC MAGAZINE 611 NOVEMBER 1983

Perfect Mates

ProWorks[™] & Lotus[™] 1-2-3[™]

the winning strategy



ProWorks[™] means new solutions to old problems. ProWorks and Lotus[™] 1-2-3[™] combine for the winning strategy—a strategy that marries the raw power of 1-2-3 with the consistency, speed, and flexibility of ProWorks. They're the perfect mates, saving you valuable time that can be focused on analyses and solutions—today, not next week. Instead of spending time setting up and building models, use the strategy that wins—ProWorks, business and personal applications for today's professional.

ProWorks[™] software series includes:
Executive Assistant, Key Business Measures,
and Business Forecasting.



Reston Computer Group
Reston Publishing Company, Inc.
A Prentice-Hall Company
11480 Sunset Hills Road
Reston, Virginia 22090

For more information call us at:
(800) 336-0338

ProWorks is a trademark of Reston Publishing Company.
1-2-3 is a trademark of Lotus Development Corporation.

The PipeLine printing buffer allows you to do more than just compute and print at the same time. But, using it may amount to nothing more than replacing expensive software with expensive hardware.

Printing Through The PipeLine

Interactive Structures PipeLine
Interactic Structures, Inc.
146 Montgomery Ave.
Bala Cynwyd, PA
(215) 667-1713

List Price: \$440

Requires: Printer with centronics standard, parallel interface.

CIRCLE 627 ON READER SERVICE CARD

Barely a year ago, a printer buffer was a marvelous new invention that promised to nearly double the use of your computer by allowing you to print files and play at the keyboard at the same time. You were lucky to be able to get your greedy hands on one.

Today, a mere buffer is not enough to



The PipeLine random access printing buffer is cased in a bright yellow metal box with the control panel on the top.

satisfy innovation-hungry consumers. To stand out from the crowd of all-too-similar products, a printer buffer now must provide such capabilities as reorganizing

data, sorting through your confusion, dotting all your i's, or polishing your bowling ball.

The PipeLine is a new buffer that may not offer miracles, but does deliver a little extra (or, in the manufacturer's view, a lot extra.) With it, you can reorganize data in chunks in order to mix blocks of graphics with text and put a chart in the middle of your monthly report. You can relocate pages and paragraphs or insert names into blanks in your prefabricated forms like a mail merge program would do. The PipeLine also allows you to print multiple copies of one file without the bother of sending it to your printer each time. Neither do you have the interminable wait to use the computer again while each copy is printing. Further, files that you use most

often—a short graphics routine for making personalized stationery with your dot-matrix printer, for instance—can be kept in the PipeLine and shot out to your printer with just a couple of keystrokes. You can even store and send commands to

IF WHAT COMES out looks like what went in, you can assume everything is working well.

your printer that your word processor doesn't know—commands, say, for different character widths, alternate typefaces, or even changing ribbon colors.

All of this magic is contained in a bright yellow box, all metal on the outside, and only slightly larger than book (Richard Bach rather than Herman Wouk) size. "Truncated trapezoidal prism" would be a scientifically correct physical description of the PipeLine: in simpler terms, that means its two long sides slope inward. Two short cables are permanently attached to this oddly shaped tin box, and an external power transformer (also known as a transistor radio AC adapter) plugs into the back of the PipeLine through a slender cord to power it.

The entire control panel of the PipeLine consists of two pushbuttons (Interrupt and Erase), two toggle switches (Bypass/Normal and FIFO/RAP), and an LED that adorns the top of the front edge of the box. These switches control the three modes of the PipeLine's operation, which combined are what sets it apart from other buffers.

Levering the first toggle switch to Bypass mode renders the PipeLine into a very expensive piece of wire, which routes the output of your PC directly to your printer—untouched and unscathed.

When you flick the same switch to Normal and the other toggle switch to FIFO (First In/First Out) and press the Interrupt button so that PipeLine knows you want to make a change, the yellow box becomes a plain vanilla printer buffer. It swallows up data as fast as your computer can send

it and feeds your printer 1 byte at a time, regardless of the rate at which your printer can consume it. Buffer capacity can be from 8 to 128 RAM, depending on the number of memory chips that are installed. The PipeLine's capacity in printed pages—a measurement—varies according to the width of your margins and the number of spaces (if any) between lines, but a rough estimate would range from several pages (at 8K RAM) to a hundred or more (at 128K RAM). Because it uses a "data compression" storage technique, a given number of memory bytes can hold more pages in the actual hardware than in your PC's disk or hard memory storage. Extra memory for buffering a greater number of pages can be added at any time. (The instruction manual even tells how to do it yourself and what integrated circuit memory chips to buy, if you don't want to order them from Interactive Structures—a thoughtful touch.)

The miracle of the PipeLine lies in its third mode, Random Access Printing (or RAP), which requires throwing the toggle switch to the position appropriately marked RAP. Interactive Structures describes the RAP function in terms of "data buckets." Computer-oriented people may be more familiar with the term "partitioned memory." Either way, this means that the whole of the PipeLine's memory can be divided into smaller blocks (buckets or partitions—segments, chunks, blocks—pick your favorite term), which



PipeLine's cable is unprofessionally finished: about a half-inch of the outer insulation is stripped off.

can be filled or sent to your printer independently of one another, and in any order you might want.

In RAP mode, 12 elementary software commands can be stacked or strung together to unleash a nearly limitless number of functions. All of the RAP functions are controlled by sending special combinations of characters from your PC

as if they were going directly to your printer. The PipeLine eavesdrops on the printer line, and when it hears a command directed to it, it intercepts the special control characters and provides the desired function.

Installing the PipeLine in your computer system is a simple procedure. Other than the power cord, there are only two cables. One connects to the end of the wire that would normally plug into your printer (a standard Centronics parallel connector—the PipeLine only comes in a parallel interface configuration); the other cable plugs directly into your printer. You won't go wrong installing the PipeLine if you pretend that it is just an ordinary printer extension cable.

The Plain Vanilla Buffer

A buffer can be described as a safe zone that insulates two warring parties. In computing, these warring parties are often a printer and its host computer, and the battle is usually one of words. The computer simply wants to dump out all of its all-electronic bon mots at a speed faster than the mechanical workings of the printer can handle. The result is that the computer's lightning speed becomes mired in the mechanical mud of the printer's painfully slow speed. Usually the computer doesn't mind the wait, but the computer owner, who invested \$5,000 in a system to save time and increase efficiency, does mind. He resents waiting for what was supposed to be a time-saving device.

A printing buffer solves this problem by sucking up data like a sponge, as fast as the computer can send it, and then slowly squeezing the data out at a speed the printer can handle.

Electronically, a printing buffer need not be complex. An elementary buffer is comprised of a block of memory, read/write random access memory chips (RAM), and whatever additional circuitry that may be required to translate "outside world" computer-to-printer communication signals into its own inner-world data storage signals. PipeLine calls its electronically simple buffer (its function) First In/First Out (remember the FIFO switch?) In the trek through the buffer, the order of the data bits in a file to be printed is not changed. The first bit in must be the first one out.

Evaluating a primitive printer buffer (or PipeLine's equivalent function, FIFO)

is easy. If what comes out looks like what went in, you can assume everything is working well. The PipeLine passes this simple test. Conclusion: Used as a mere buffer, the PipeLine will save you time. You can, in fact, print and compute simultaneously.

Nonetheless, your expectations must be reasonable. When using a printing buffer for the first time, you might be surprised that it does not instantly drain all the data out of the computer and allow you to go on to your next task without a pause. Alas, no data transfer can be instantaneous. Even with PipeLine's quick parallel interface, you'll still have to wait those few seconds or minutes for it to suck your PC's memory dry. A one-page letter can be dispensed with in barely the wink of an eye, especially if you have arthritic eyelids. Fifty or one hundred-page reports may allow you enough time to grab a cup of coffee. In either case, the wait is short and not too annoying. The slower your printer was without the buffer, the greater the time savings will seem with a buffer.

To get the most out of your printing buffer, you must use continuous form paper (either roll or fanfold tractor fed), because, unless you have four hands, you

in the memory hardware itself. Rather, the beginning and end of each segment, or partition, is marked by the insertion of extra control characters. A microprocessor—essentially a tiny computer inside a single integrated circuit chip—keeps track of each memory partition and allocates the PipeLine's RAM among the different partitions as needed. But the microprocessor doesn't just chop things up on its own. Your PC instructs it when to begin and end each partition and what to do with each one—either keep it in memory or send it to the printer.

Normally, the PipeLine remembers all of the data sent to it, no matter how many partitions it has been instructed to create. When it receives an instruction to print the contents of a given partition, the PipeLine's microprocessor examines the whole of memory, looking for the control characters that mark the beginning of the desired partition. It then starts sending all of the data it encounters in that partition to the printer until it finds the control character marking the end. Then it stops

sending data, sits back, relaxes, and waits for the next instruction.

At first, the buffer's ability to make partitions and send them in any order might not seem especially useful to you. Why would you want to alter the order of signals coming from your PC to our printer? Changing the order of letters within words would be rather confusing; you'd end up with gibberish. Other changes of order, such as moving and rearranging chunks of data that already have a logical on-paper order, are handy, however. For instance, you fill a partition with the data for a Visi-Trend/Plot chart, and then send PipeLine a command to print that partition in the middle of a sales/promotion letter—an effective way to mix text and graphics. Because commands to the PipeLine consist of combinations of printable characters unlikely to occur in normal text, they can be stored along with the characters of a normal word processor file. For instance, a PipeLine command embedded within a letter can contain a complete graphics routine—or a boilerplate para-

ALAS, NO DATA transfer can be instantaneous.

won't be able to compute and load the printer at the same time. And even if your word processor is smart enough to pause and allow you to change sheets, you'll be able to buffer only one page at a time, which is a waste of the buffer's abilities. Buy a tractor feed for your printer first; then consider buying a printer buffer.

Breaking It Up

What distinguishes PipeLine from ordinary printing buffers is its ability to partition its memory. Normally, the memory of a buffer has no particular organization. The bits of data are just squeezed through the buffer without obstruction. The RAP function, however, divides up the length of the PipeLine into short segments (up to 63 of them). Nothing actually is changed



Have You Met EATER?



If not, then you haven't played **SPACE MINER™**

EATER, RIPPER and SPARKY love to devour mining ships! Your challenge is to collect mineral asteroids with your robot claw while you dodge and blast your way through the monsters.

"... a colorful, exciting shoot'em-up space game ... The three monster species are wonderful..."
Joe Davis, Creative Computing, September, 1983

"... surprises ... pretty graphics ... (including) the 3-D effect of moving stars on different planes..."
Corey Sandler, PC Magazine, September, 1983

SPACE MINER™ is available at **ComputerLand™** and other fine dealers, or you can order directly from
RESOLUTION SOFTWARE, 8 Edgewood Boulevard, Providence, RI 02905 401/461-2417
 \$29.95 (VISA/MC or personal check accepted)



Resolution
software

CIRCLE 731 ON READER SERVICE CARD

causes the PipeLine to ignore everything in the partition until the next @7 command is encountered. By surrounding notes for text with @7s, you can prevent them from being printed.

Command errors can be avoided by changing the introductory character. An @@ command tells the PipeLine to change the command lead-in character to match the character that immediately follows the @@ command.

In the RAP mode, the PipeLine is nothing like a simple printer buffer. It doesn't send data to your printer while you fill it with information from your computer. After all, it expects to have its memory partitioned, and to be told in what order you want them printed. Consequently, the PipeLine operates in two modes, Fill-up and Print. To enter Print mode, send the command @9, which tells the PipeLine that you're finished sending it data. To switch back to the Fill-up mode, you send the @1 command. And, when you don't know what else to do, send an @0 command, which will cause the PipeLine to

erase all its memory and enter whatever mode at which its control panel switch is set. (Pressing the Interrupt and Erase buttons simultaneously will have the same effect.)

**YOUR PRINTER,
generally obedient and
dumb, may blindly
finish the last 12 lines
on its rubber platen.**

An evaluation of the PipeLine is straightforward, at first. Just answer the simple question: Does it do what it claims? Plug it in, try it out; the answer is yes. The PipeLine does everything it claims to do, in exactly the manner promised. But that's hardly the whole story.

The question is not whether it works,

but how well it works for you. The special features of the PipeLine set it apart from the common order of printer buffers, and these features are probably a reason to choose PipeLine over the other products.

If you're more into printing than programming, the PipeLine may be more than you want to deal with. Using it effectively entails learning the instruction set. The set PipeLine uses is small enough that proper commands will probably become second nature to you within just a few hours. Nevertheless, using the commands can be unwieldy, and it's easy to make an error. For instance, imagine sending the string @R@6B@6C@6M@6S@6E@8@9 (an example given in the PipeLine manual, which creates a partition that prints five other partitions in a particular order).

Furthermore, since the PipeLine manipulates data after it leaves your computer, visualizing what the results will look like is left to the imagination. If you choose to pile partitions on top of one another, you won't know what you've got.

On the Fine Art of Business Communication

* Features:

- The first Host communications system for the IBM Personal Computer
- Run programs from a remote site with a terminal or another computer
- Use as a personal communications system or electronic mailbox
- Full Upload/Download facility for ASCII files
- Easy set-up, installation, and especially easy to use
- Full system operator support
- Three level password protection
- Unattended operation

ADD ON FEATURES:

HOSTCOMM by JANADON **\$170.00**

PACE-MAIL

- Complete electronic mail system for HOSTCOMM users. **\$80.00**

ORDERTRANS

- Turn HOSTCOMM into an electronic catalog. Display product information and gather order data from customers. **\$40.00**

CONFERENCING

- Allow topical idea exchange and posting for your users. **\$80.00**

HOST UTILITIES I

- A set of four programs for off-line maintenance. **\$50.00**

HOST UTILITIES II

- Three programs to allow HOSTCOMM users additional function on-line. **\$50.00**

Minimum Systems Requirements:

- 128KB System Unit
- PC-DOS 1.0/1.1/2.0
- Hayes Smartmodem 300 or 1200



NF Systems, Ltd.
P.O. BOX 28348, ATLANTA, GA 30358
404-252-3302-VOICE
404-252-4146-DATA



MAGNUM PC

1-800-544-4354

GA Residents 404-691-3351

VISA

CREDIT CARDS

MasterCard

4055 WETHERBURN WAY SUITE 205 ATLANTA, GA 30302

PRINTERS

ITEMAN	440
C. ITOH 8510 Prowriter	390
1515 Prowriter	CALL
F10-40 CPS	1160
55 CPS	SAVE
OKIDATA 83A	SAVE
84	895
IOS	CALL
NEC SPINWRITERS	CALL
EPSON - MX, FX, RX	CALL
TOSHIBA	CALL

DISKS

TANDON TM 100-2	740
10-MEG HARD	1305
DAVING	CALL

BOARDS

QUADRAM 64K/256K	CALL
PROFIT SYSTEMS	FROM 290
MORTE CARLO	BEST PRICE
SIIMA	CALL
TECMAR	CALL

MONITORS

TAXAN 105 AMBER - 12"	145
100 GREEN - 12"	140
RGB-H MED RES.	325
RGB-H SUPER HI RES	CALL
AMDEK 300 A OR G - 12"	144
310 AMBER - 12"	CALL
NONAME AMBER - 12"	130

MODEMS

NOVATION SMART-CAT 1200 BAUD	470
SMART-CAT 300 BAUD	CALL
J-CAT 300 BAUD	117
APPLE-CAT	CALL
HAYES SMART MODEM 1200	515
1200 B	CALL
300	212

SOFTWARE

FRIDAY	CALL
D-BASE II	420
WORDSTAR	CALL
BOTTOM LINE	CALL
CHAMPION	CALL
MULTIPLAN	CALL
SUPERCALC	CALL
PEACHTREE ACCOUNTING SERIES	BEST PRICE

ACCESSORIES

STANDBY POWER SYSTEMS	CALL
SURGE PROTECTORS	FROM 47
CHIPS - 64K	55
RIBBONS - MOST PRINTERS	BEST PRICE
DISKETTE STORAGE ITEMS	CALL
CABLES	BEST PRICE

DISKETTES

	CASE 100	BOX 10
VERBATIM SS/SD	220	26
SS/SD	250	30
OS/SD	330	36
3M SS/SD	220	26
SS/SD	250	30
OS/SD	330	36

APPROVED CORPORATE ACCOUNTS WELCOME

SPECIAL USER GROUP PRICING

— CALL FOR DETAILS —

CASH PRICES ADVERTISED AND QUOTED. AVAILABILITY AND PRICES SUBJECT TO CHANGE WITHOUT NOTICE

CIRCLE 386 ON READER SERVICE CARD

ten yourself into until print hits the paper. It might take two or three tries before you get a printout you're satisfied with—a waste of both time and paper.

Mixing graphics and text in one docu-

IT'S HARD TO ignore the packaging—its bright yellow finish screams for attention.

ment is one of the PipeLine's greatest attractions, but if you're not careful the result may be like mixing oil and water. For instance, should your word processor perform automatic page formatting, dropping a block of graphics in the middle of a previously formatted page probably will have undesirable consequences. Typically, your word processor plans to fill a page 66 lines long, spacing out the top and bottom margins with blank lines. The PipeLine has no page formatting capability; it just mixes things together with the kind of care a McDonald's cook, not Julie Child, would take. You splice 12 lines of graphics in the middle of a 66-line page, you end up with a 78-line page, on 66-line paper. Your printer, generally obedient and dumb, may blindly finish the last 12 lines on its rubber platen.

There are two solutions. You can tell your word processor the text page will be only 54 lines long (if you've mastered your word processor), or you can add @ 7 commands around a block of text equal in size to the graphic insertion you want to make, which will make the text invisible to PipeLine. Either method works, but first you must calculate the proper sizes so that everything fits. And if you change the insertion, you've got to go back and change everything else.

You probably can achieve the same effect without the PipeLine by leaving a blank hole in your text on a page and running the paper through your printer twice—once for text and once for graphics. It works and is probably cheaper than buying PipeLine, especially if you need to do it only once in a while.

Using the PipeLine to merge names into documents is like hiring an earth

mover to weed the garden—don't expect a particularly elegant job. PipeLine, although quite intelligent, cannot reedit the length of lines. If the names on a list include Don Ho and Theophilous Gono-wandapothanondalous, you can expect some awfully ragged margins. Your printer may blithely peck its way off the page. Don't even think about justification (in any sense of the word). Nor will the PipeLine handle a lengthy list. The small number of partition labels limits it to fewer than 63 different insertions.

Nonetheless, you can work around these shortcomings. By making adjustments to your text formatting, you can use the PipeLine to make every sheet of paper into custom stationery. Store the graphics commands or escape sequences for your printer in the PipeLine and elicit them with a simple instruction for each letter, even coming from a belligerent word processor.

Form Versus Function

No matter how you view the PipeLine, it's hard to ignore the packaging—its bright yellow finish screams for attention. That's strike one against the design. The IBM PC, with its businesslike appearance, is designed to fit into the most conservative office, and the glaring PipeLine looks a bit out of place. You would hope the flat, compact package could be stuffed away out of sight, but the PipeLine apparently was not designed for hiding—its controls are on top.

Strike two against the design is its external power transformer. There's nothing wrong with the outboard transformer itself, unless you have minor prejudices, as I have. The big, black thing is inconvenient to plug into a confined space (say, for example, behind a loaded filing cabinet). Once it's quietly absorbing electrical nourishment, its bulk takes over the outlet, making it difficult to plug in anything else. And it's always there; so it's only a few watts, it's just as incessant and as costly as a dripping faucet.

The external transformer brings even worse problems with it. Although it secures itself tightly to the outlet, it's attached to the PipeLine itself by a standard battery edapter plug and jack. This means that it's easily unplugged, especially accidentally. Even a neophyte in computing should know what happens when a block of RAM memory loses its electric

supply—total amnesia. All the data stuffed into the PipeLine vanishes without a trace. Sure, you probably will still have all of your vital information safely stored in your PC, but you'll have to spend time sending it back out to the printer, and more time duplicating the first part that was already printed. And that wastes the valuable computer time the PipeLine was supposed to be saving.

Strike three against the design of the PipeLine is the care taken in workmanship and finish. Although the internal electronics are reasonably well designed and installed on professional quality circuit board, the outside-final touches are

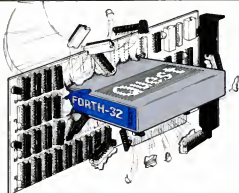
THE COMMANDS of the PipeLine are easy to learn, but it may be more satisfying to have a good grasp of your computer's software.

rough and have a home- or garage-made look. My big beef, though, is the mounting of the two cables that run to the outside world—to your PC and printer. Although the instruction book shows flat "ribbon" cables, the unit I tested was equipped with fat, round shielded cable. That's good, because shielding helps to prevent radio interference; but on the PipeLine, the attachment of the cable leaves much to be desired. The connection does not seem terribly strong, perhaps only one accidental yank from disaster. And the cable itself is unprofessionally finished: At least a half-inch of the outer insulation is stripped off, leaving the frayed, woven copper shielding bare to the world, waiting to pierce microholes in careless fingers.

None of these deficiencies will cause problems in normal operation provided you are careful. Take note, however, that nearly everything the PipeLine does can be done in another way. Once you have a foundational knowledge of DOS, you can set up and manipulate files on disk just as you would partitions in the PipeLine. Software is readily available to turn a

block of your PC's RAM into a print spooler, which is merely an internal printer buffer. Certainly either method works—your choice depends on which is easier for you to operate. The commands of the PipeLine are easy to learn, but it may be more satisfying to have a good grasp of your computer's software.

The PipeLine manual says, "Random Access Printing eliminates the need for costly software or special packages to combine output from different sources." This statement is indeed true. However, in buying the PipeLine you merely will be substituting costly hardware for the costly software. /PC



Break Through the 64K Barrier!

FORTH-32™ lets you use up to one megabyte of memory for programming. A Complete Development System! Fully Compatible Software and 8087 Floating Point Extensions.

Quest™
Quest Research, Inc.

303 Williams Ave.
Huntsville, AL 35801
(205) 535-8405

Call today toll-free or
contact a participating
Computerland store.

800-558-8088

Now available for the IBM PC, PC-XT, COMPAQ, COLUMBIA MPC,
and other PC compatibles!

IBM, COMPAQ, MPC, and FORTH-32 are trademarks of IBM, COMPAQ, Columbia Data Products, and Quest Research, respectively.

CIRCLE 493 ON READER SERVICE CARD

Will This Happen to You?

NOT IF YOU BUY YOUR PRINTER
FROM...

THE PRINTER STORE

The IBM Personal Computer is a great product, but assuring its compatibility with printers requires expertise.

AT THE PRINTER STORE, we specialize in printers so our trained professional staff can help you choose the right printer for you and your P.C.. When you buy a printer from us, you can be assured that your purchase will also include:

- FREE TECHNICAL CONSULTATION
- FULL AFTER SALE SUPPORT
- FULL FACTORY AUTHORIZED SERVICE

DOT MATRIX PRINTERS

EPSON SERIES

FX 80	\$ CALL
FX 100	\$ CALL

OKIDATA SERIES

82A	\$ CALL
83A	\$ CALL
92A	\$ CALL
93A	\$ CALL
84 (parallel)	\$ CALL

C. ITOH SERIES

8510 Prowriter	\$ 395
Prowriter II	\$ CALL
New! Banana	\$ 239

IDS SERIES

Microprism 480	\$ CALL
Prism 80	\$ CALL
Prism 132	\$ CALL

GEMINI SERIES

Gemini 10X	\$ CALL
Gemini 15X	\$ CALL
NEC 8823	\$ 418
Toshiba P 1350	\$ 1750

LETTER QUALITY PRINTERS

BROTHER SERIES

HR-1 (parallel)	\$ CALL
HR-1 (serial)	\$ CALL
HR-15	\$ CALL

COMREX SERIES

CR-1 (parallel)	\$ 795
CR-1 (Serial)	\$ 865
CR-2	\$ CALL

C. ITOH SERIES

F-10 40 CPS	\$ CALL
F-10 55 CPS	\$ CALL

Juki 6100

Juki 6100	\$ CALL
-----------	---------

Dotmatrix 48K

NEC SERIES

3510	\$ CALL
3530	\$ CALL
3550	\$ CALL
7710	\$ CALL
7730	\$ CALL

NEC Accessories

NEC Accessories	\$ CALL
-----------------	---------

C. ITOH 8510

Prowriter

- 120 CPS - 13K Buffer - 144x60 dots 1 inch
- Nx9 dot matrix - Proportional Spacing - 8 Character sizes - 5 unique alphabets - Greek character set - Graphic symbols - bi-directional, logic-seeking - Adjustable tractors - Single-sheet friction feed - Vertical & horizontal tabbing

C ITOH 8510 Prowriter List \$795 **\$395**



BROTHER HR-15

- 13 CPS - Bi-directional - Super & Subscript
- 10, 12, 15 and Proportional Spacing Pitch
- Optional Tractor, Sheetfeed and Keyboard

Parallel	\$ CALL
Serial	\$ CALL

INTERFACE EQUIPMENT

Apple Dumping	\$ 145
Grappier Plus	\$ CALL
Complete stock of Epson Accessories	\$ CALL
Custom Printer Cables for Apple, Atari, IBM	
TRS-80	\$ CALL
Printer Stands, large	\$ 95
Printer Stands, small	\$ 25
Printer Ribbons	\$ CALL
Printer Sound Enclosures	\$ CALL
Vic 20/Comm 64 Interface	\$ CALL

- 1) LOW PRICES
- 2) SAME DAY SHIPPING
- 3) FREE TECHNICAL SUPPORT
- 4) FULL SERVICE OPTION

We carry a full line of Cables and Accessories

Call (714) 241-0701 and ask us about...

PHONE REBATE

THE
Printer

We are so confident of our LOW PRICES and SUPPORT that we are going to ask you to make the initial investment by calling us. In return, when you buy your printer from us, we will rebate the cost of your call and deduct it from your invoice.

HOW TO ORDER: Our phone lines are open from 8 a.m. to 6 p.m. PST Monday-Friday. We accept VISA, MASTERCARD (all 30 extra charge), personal checks (take two weeks to clear, C.O.D.'s accepted). Same-day shipment on orders placed before 1 p.m. Manufacturer's warranty applicable on all equipment. Prices subject to change.

STORE - 2720 S. Harbor Blvd., Suite E, Santa Ana, CA 92704

© The Printer Store 1063

HARDWARE/COREY SANDLER

*Last month PC Magazine presented a review of 13 dot-matrix printers and pondered whether these new machines had redefined the term "letter-quality."
This month PC discovers more answers . . .*

A Plenitude of PRINTERS: Part Two





In his article "A Plentitude of Printers" (PC, Volume 2 Number 5), author Winn Rosch points out that although 13 printers were put through their paces it was not possible to test every feature belonging to each printer. To provide you with more information for a better comparison PC has produced two bar graphs that depict the tested high speed performance in characters per second (cps) versus the manufacturer's claimed high speed, and the tested noise level for each printer. For purposes of comparison, we have also reproduced print samples from each printer. The manufacturers' addresses and list prices (where available) are listed separately.

Each of the 13 machines was tested in the PC office. In-depth reviews of some of

WHEN
*shopping for hardware,
price is not necessarily
the best measure of
quality.*

these printers will appear in future issues of PC. Suffice to say when shopping for a printer, you should keep this checklist in mind: What you want to produce on your printer: Charts and graphs or business letters and reports? Where will the printer be located; in a business office or in your office at home? Will the additional noise drive your fellow workers to distraction, or will you be the only one to hear your printer as it generates copies of your latest literary masterpiece? And how much do you want to spend? Keep in mind when you go shopping that printers can range from under \$500 to over \$5,000. As always when shopping for computer hardware, price is not necessarily the best measure of quality. Know your capability requirements before making a purchase decision. /PC

Product and Price Information

Mannesmann Tally MT-180

Mannesmann Tally
6301 S. 180th St.
Kent, WA 98032
(206) 251-5500

List Price: \$798

NEC PC-8023A-C

NEC Information Systems, Inc.
5 Militia Dr.
Lexington, MA 02173
(617) 862-3120

List Price: \$499

Okidata 2410

Okidata Corp.
111 Gaitheri Dr.
Mt. Laurel, NJ 08054
(609) 235-2600

List Price: \$2,995 (parallel); \$3,145 (serial)

Printek 920

Printek
1517 Townline Rd.
Benton Harbor, MI 49022
(616) 925-3200
Telex: 810-270-3112

List Price: \$2,395

Texas Instruments 810-LQ

Texas Instruments, Inc.
Data Systems Group
P.O. Box 1444, M/S 7793
Houston, TX 77011
(713) 490-2000

List Price: \$2,495

Toshiba P-1350

Toshiba America, Inc.
Information Systems Division
2441 Michelle Dr.
Tustin, CA 92680
(714) 730-5000

List Price: \$2,195

Anadex WP-6000

Anadex, Inc.
20732 Lassen St.
Chatsworth, CA 91311
(213) 996-6010
TWX: 910-494-1761

List Price: \$2,700

Dataproducts M-100

Dataproducts
6200 Canoga Ave.
Woodland Hills, CA 91365
(213) 887-8489
Telex: 67-4473

List Price: \$3,000

Datasouth 220

Datasouth Computer Corp.
P.O. Box 240 947
Charlotte, NC 28224
(800) 436-5050
(704) 523-8500

List Price: \$1,995

DEC LA-100-PC

Digital Equipment Corp.
Terminals Product Group
2 Mt. Royal Ave., UPO1-S
Marlboro, MA 01752
(600) -Digital ext. 700

List Price: \$1,595 (receive); \$2,195 (transmit)

Envision 430

Envision
631 River Oaks Pkwy.
San Jose, CA 95134
(408) 946-9755

List Price: \$5,450

Florida Data OSP-130

Florida Data Corp.
600 D. John Rodes Blvd.
Melbourne, FL 32935
(305) 259-4700

List Price: \$4,100 manufacturer's suggested retail price.

Infoscribe 1100

Infoscribe, Inc. (INF)
2720 S. Croddy Way
Santa Ana, CA 92704
(714) 641-8595
Telex: 692422

List Price: \$1,795

About The Charts

The two comparative bar charts in PC Magozine's analysis of the newest generation of dot matrix printers were prepared on a Hewlett-Packard HP-7470A two-pen flatbed plotter.

The charts entitled "Printer Noise Level" and "Price Versus Top Speed" were drawn under the instruction of the new Peachtree Business Graphics System package for the IBM PC. That system includes Line, Bar, Area, Double-sided Bars, Pie, Word, Critical Ratios, Histograms, and Scatter Charts.

Remember that price—and speed—are not everything. There are super-fast printers whose quality may be unacceptable to you. There are slow, inexpensive machines that may otherwise fit your needs exactly. Be sure to examine the print samples and full technical and qualitative details that appeared in *PC*, Volume 2 Number 4.

The chart entitled "Printer Top Speed" was prepared with Graphwriter software for the IBM PC. The "basic" set of charts in that package includes Vertical Bars, Horizontal Bars, Segmented and Clustered Bars, Pies, Line, Scatter, Bar/Line Combination, and Word Charts. An "extension set" of charts, due on the market soon, will include such specialized offerings as Gent, Organization, Bubble, Table, Pie/Bar Combination, Surface, Double Stacked Bars, Grouped, and Range charts.

The difference between the manufacturer's claimed top speed and the PC Magazine test results is often akin to the difference between an automobile company's mileage claim and that discovered by the bill-paying customer. A manufacturer may run its test using a particularly easy set of characters and with a program optimized to the machine. PC's test (the BASIC listing was published in Volume 2

Number 4) is designed to put a printer through a difficult, real-life run.

Charts prepared by Corey Sondler

Peachtree Business Graphics System
Peachtree Software, Inc.
3445 Peachtree Road, N.E.
Atlanta, Georgia 30326

CIRCLE 576 ON READER SERVICE CARD

Graphwriter
Graphic Communications, Inc.
200 Fifth Ave.
Waltham, Mass. 02254

CIRCLE 537 ON READER SERVICE CARD

H-P 7470A Plotter
Hewlett-Packard
1501 Page Mill Road
Palo Alto, Calif. 94304

CIRCLE 536 ON READER SERVICE CARD

Printer Top Speed

Manufacturer's Claims vs. PC Magazine Tests



Chart by Grapherstar (San Diego)
Graphics Communications, Inc.
300 Fifth Avenue, Suite 400, San Diego, CA 92101

Chart 1: Test results for Texas Instruments printer were not available.

Printer Noise Level

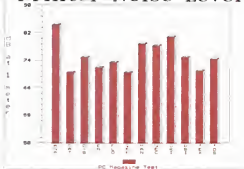


Chart 2: The dB sound level reading for DEC printer was not tested by PC.

Key to Charts

MAN	Mannesmann Tally MT-160
NEC	NEC PC-8023A-C
OKI	Okidata 2410
PRI	Printek 920
TEX	Texas Instruments 810-LQ
TOS	Toshiba P-1350
ANA	Anadex WP-6000
DAT	Dataproducts M-100
D-S	Datasouth 220
DEC	DEC LA-100-PC
ENV	Envision 430
FLO	Florida Data OSP-130
INF	Infoscrite 1100

Price vs. Top Speed

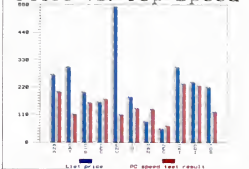


Chart 3: Print speed is as indicated on the axis. Prices are times 10.

True or False: You Can Now Run Apple Software in Your IBM® PC.

✓ True. Introducing Quadlink by Quadram. The revolutionary enhancement board that turns your IBM Personal Computer into an Apple-compatible system.

Quadlink. Simply plug it inside your PC, press a few keys, and instantly run virtually any Apple software package available.

Quadlink greatly enhances your PC's capabilities.

✓ True. Quadlink gives you access to the largest software library ever written. Business, educational, and entertainment packages. Software for any professional or home use. This means your PC can now do more than ever before. In more ways than ever before.

With Quadlink, there's no diskette reformatting needed.

✓ True again. With Quadlink you'll never have to worry about "compatibility." Just put your Apple diskette in the PC drive and watch it go. It's that easy. Like having an Apple computer inside your IBM.



QUADLINK™ BY QUADRAM™

And every Quadlink comes with that traditional Quadram Quality built right in.

✓ Absolutely true.

Quadlink is available only at authorized full-service Quadram dealers.

✓ True. So visit the Quadram dealer nearest you today and ask to see Quadlink in action. And while you're there ask about our full line of IBM PC enhancements. Including the popular six-function Quadboard.™ You'll agree: when it comes to quality engineering and dependable performance, Quadram passes the test.

AVAILABLE AT AUTHORIZED FULL
SERVICE QUADRAM DEALERS
WORLDWIDE

© Copyright 1983
Quadram Corporation
All rights reserved

Apple and the Apple logo are
registered trademarks of
Apple Computer, Inc.

IBM and the IBM logo are
registered trademarks of
International Business
Machines Corporation.



QUADRAM
CORPORATION

4200 International Blvd. Suite 100, Irvine, CA 92618
(408) 252-0886, TWX 311 700-4011, QUADRAM NICH

CIRCLE 327 ON READER SERVICE CARD

\$680.00
Suggested Retail

Though the microworld has changed in the wake of the IBM PC's progress, computers based on the older S-100 bus are useful—and compatible—vehicles.

MS-DOS Boards The S-100 Bus

Even if all the software you like is for the IBM PC, don't throw away your S-100 system. You can add MS-DOS to existing microcomputers that use the older plug-in design. Several firms are even about to market new S-100 MS-DOS machines.

Manufacturers cite these reasons for sticking with the S-100 bus for their MS-DOS systems: faster processing, greater flexibility, and the economic savings from extending the life of current systems.

Of course, MS-DOS is not PC-DOS, and not every program that runs on the PC will run on the MS-DOS versions used on these S-100 machines. The important part of PC-DOS compatibility, most software experts agree, is not really the disk operating system itself—instead, the key is in the direct use of the IBM's ROM calls and display RAM by programs based on PC-DOS. Although a program should, theoretically, make all its requests for hardware services from the DOS, Microsoft never defined any graphics within MS-DOS, and IBM has encouraged developers to bypass the DOS and instead to make direct calls

to hardware.

Even so, many developers of major software packages are adding "vanilla" MS-DOS versions to their lists of supported formats. Major distributors expect this trend to support MS-DOS will continue.

According to Microsoft's Chris Lawson, there are four direct sources of MS-DOS for S-100 machines. You can either get software from Lifeboat Associates, or hardware and software combinations from Seattle Computer Products, Zenith Data Systems, and Lomas Data Products Company. A fifth firm, Computer House, buys MS-DOS from Lomas for resale.

The Lifeboat Line

If you have the right hardware, the Lifeboat route can be the quickest and the least expensive, but it is a bit unconventional. Lifeboat sells MS-DOS for a standard 16-bit S-100 system from CompuPro, but there's no formal contact between the two companies.

CompuPro officially endorses only CP/M-86 for 16-bit systems; spokesperson Jeff

Swartz says that CompuPro's policy is to concentrate its energies on the Digital Research operating system. Lifeboat decided to support the CompuPro system because of requests from software developers, and because CompuPro's hardware has a reputation as a reliable, well-supported system.

Lifeboat configures its SB-86 version of MS-DOS for a standard CompuPro system designed to run both CP/M-80 and CP/M-86. The system uses a dual processor CPU card, which carries Intel 8085 and 8088 microprocessor chips.

Although the preliminary Lifeboat implementation was targeted for software developers and sold under a no-support, no documentation policy, Lifeboat President Edward Curria says that his firm now includes the CompuPro version of MS-DOS in its regular SB-86 product line, with full support and updates. The supported version is priced at \$200 and comes with the Emulator-86 program that allows CP/M-86 programs to run under MS-DOS.

LOWEST IBM/PC SOFTWARE PRICES GUARANTEED

We hereby certify that your purchase from Discount Software represents the lowest price sold anywhere. If you find a lower price on what you purchased within 30 days, send the ad and we'll refund the difference.

	DISCOUNT PRICE
Lotus 1-2-3	\$316
WORD PROCESSING	
Multi-Tool Word & Mouse	\$399
Wordstar	\$299
Spellstar	\$199
Mailmerge	\$179
Wordstar Professional	\$549
Easywriter II	\$299
EasySpell II	\$159
Select/Spell	\$496
Write On	\$115
Spellguard	\$199
Spellbinder	\$349
Final Word	\$264
Wordex	\$159
Edix	\$159
Volkswriter	\$179
LANGUAGES & UTILITIES	
Crosstalk	\$139
Move-It	\$129
BSTAM or BSTMS	\$149
Pascal MT + Compiler (only)	\$496
CBASIC 86	\$294
XLt 86	\$135
MBasic (MSDOS)	\$265
MBasic Compiler (MSDOS)	\$299
Cobol (MSDOS)	\$599
Pascal (MSDOS)	\$399
Fortran (MSDOS)	\$299
CP +	\$175
C (MSDOS)	\$399
OTHER GOODIES	
Mouse	\$189
Joystick	\$49
64 K Memory Card	\$239
256 K Memory Card	\$549
SuperCalc II	\$265
VistCalc	\$219
Vistrend/Plot	\$259
Vistdex	\$119
Easyfiler	\$359
Mathematic	\$95
dBASE II	Call \$4??
Friday	\$265
Statpak	\$449
Optimizer	\$174
Desktop Plan.	\$259
Sales Pro	\$539
Market Analyst	\$445
All Games	Less 15%



**FREE
WITH PURCHASE**
Complete Software
Buyer's Guide
(\$5.00 value)

PC1183

Please add \$3.50 Postage and Handling for each item. Cal residents add 6.5% Sales Tax. 17% Blue Label is an additional \$10.00 per item. C.O.D. \$3.00 extra. Call for overnight delivery. Prices subject to change without notice. All items subject to availability. Outside Continental U.S. Add \$10.00 plus Air Parcel Post.

**ORDER TOLL-FREE
VIA VISA OR MASTERCARD:
1 800 421-4003**

or 1 213-837-5141 Call: 1 800 252-4092
6529 Saine Avenue, Los Angeles, CA 90028

DISCOUNT SOFTWARE

CIRCLE 236 ON READER SERVICE CARD

Lifeboat's preliminary, no-frills version was available only as MS-DOS 1.25 on 8-inch disks. But if you had a CompuPro system of the correct vintage, all you had to do was slip the disk in and reboot. The package also works on current CompuPro systems, but the newer boards need the "GO-86" ROM, which is no longer used for the standard CP/M-86 system, but is still available from CompuPro and its dealers.

The first version to be fully supported by Lifeboat was an MS-DOS 1.25 that would only read 8-inch disks. Later this fall, the full 2.0 version of MS-DOS with support for both 5¼-inch and 8-inch disks, should become available. CompuPro has added 5¼-inch capability on the "L" revision of its Disk 1 controller card, so that should ease the task of using MS-DOS.

Stopping By The Computer House

If you want a supported CompuPro version of MS-DOS and the ability to read IBM-format 5¼-inch disks right now,

MS-DOS: Born on the S-100 Bus

The operating system most widely used on the IBM PC spent its early days in Seattle.

The MS-DOS operating system was actually born on the S-100 Bus. In 1979, when Seattle Computer Products first turned its hand from pecking memory boards to putting the new Intel 8086 microprocessor on a CPU card, there was no readily available operating system. Digital Research was slowly developing CP/M-86, but rather than wait out the delays, SCP decided to go ahead on their own.

The first versions of QDOS, the "Quick and Dirty Operating System" were released in 1980, and served mainly to support Seattle's 8086 board. But Seattle made a marketing agreement with its neighbor, Microsoft, which later grew into a sale of exclusive rights. In the few short generations from 1.14 to 1.25, the humble origins of MS-DOS have passed almost completely from the microcomputing community's consciousness. —S.R.

another route is to buy the MSPRO package from Computer House. This firm is a CompuPro System Support

MANY
developers of major
software packages are
adding "vanilla" MS-
DOS versions to their
lists of supported
formats.

Center that assembles various systems using mostly CompuPro equipment. By adding a disk controller from Lomas Data Products, Microhouse gives its package both the ability to read IBM PC disks end to qualify for the license to use MS-DOS.

With the MS-DOS diskette alone, a standard CompuPro system can run MS-DOS and be used for software development or general computing use. With the Lomas controller installed as well, the system can also read and write IBM PC-compatible files on the 5¼-inch drives, and now run programs and store data on either 5¼- or 8-inch drives.

The full MSPRO package includes the GO-86 PROM, the Lomas controller set up for 5¼-inch disks, MS-DOS, documentation on the system, and the standard Microsoft MS-DOS manuals. Computer House president Leon Kunstenaar noted that his firm provides full telephone support end is committed to bringing up successive releases of MS-DOS.

Various combinations of software, controller boards, and disk drives are available, with prices ranging from under \$400 to just over \$1,000.

North to Seattle

Seattle Computer not only had an Intel 8086 on the S-100 bus long before there was an IBM PC, this company even wrote the ancestor to what is now MS-DOS. The Seattle 8086 CPU was the first widely dis-

tributed personal computer card to have a chip in the Intel 8086/8088 family: it still is one of the most powerful CPU cards around.

Lately, Seattle Computer has been concentrating its energy on the Gazelle, a high-end machine that runs MS-DOS. This cabinet-sized machine has 18 slots, up to 896K of memory, and an 8-inch Winchester disk. Sales have been mostly to software houses and to users who would have bought minicomputers instead of micros in the past.

Seattle Computer's next step, says Brian Bertlin, is a multi-user version of the Gazelle that runs Microsoft's Xenix. The Xenix system is intended to be compatible with both the UNIX operating system used on many minicomputers and MS-DOS.

But there's apparently other, more modest machines in the works at Seattle as well, although company officials are not willing to talk about details. Given the firm's commitment to MS-DOS and the S-100 bus, it would only be reasonable to

expect a machine that combines those areas of expertise.

At Zenith Data Systems, the MS-DOS vehicle is the Z-100, a series of desktop machines with both 8085 and 8088 processors. The series also features high resolution displays, monochrome and optional color graphics, and space for more than 800K of memory. The desktop and low-profile models all use built-in 5¼-inch disks and provide four extra S-100 card slots for expanding or upgrading the system.

The Z-100s are also available in kit form, as part of the Heathkit line under the H/Z-100 name. By putting a system together yourself, you can save hundreds of dollars. The Heathkit manuals are well-known for their clarity. With systems under either Heath or Zenith names, you can add 8-inch disks and an 11-megabyte hard disk.

The Lomas Road

At the end of the circuit on this bus

tour is Lomas Data Products, which announces itself as a full-line S-100 MS-DOS company. It produces the S-100 PC, a desktop S-100 system with an 8088 processor and MS-DOS. With its two double-

S-100 MACHINES *have quicker machine cycles, wider data paths, and speedier disks.*

sided 5¼-inch disk drives, 128K of memory, two serial and parallel ports, and a calendar, the whole system sells for just under \$3,000.

Lomas also makes a range of 16-bit boards, from a \$350 single-board 8088 computer with only 1K of RAM to a super-fast 8086-based CPU card with 8087 math processor and 8089 I/O processor. The new Intel 80286 board from Lomas should be 5 to 10 times as fast as an IBM PC.

Lomas has other S-100 MS-DOS products in the works. According to Richard Lomas, the company's president, a single-board system with an Intel 80186 for the CPU, three open S-100 slots, and some bundled software is about ready for release. Pricing was not set when this was written, but the company says it might be less than \$2,000.

In the Speed Zone

According to dealers, the two biggest factors that prompt buyers to choose S-100 systems are their fast speeds and great flexibility. Engineers and software developers like the higher throughput and business buyers like the idea of being able to upgrade the system.

Frank Warren says that his Heyward Systems Group is selling computers from both CompuPro and Seattle Computer Systems to engineers in Silicon Valley. Warren says that these users find the Seattle system to be about four times as fast as the IBM PC for programs involving complex calculations. The Seattle system with the 8087 coprocessor adapter is fast

Software Suitable for MS-DOS

What programs can be run on an MS-DOS system without the PC's trimmings?

There seem to be four separate routes to bringing MS-DOS programs to market. They can be done as independent projects, as derivations from PC-DOS, as derivations from CP/M-86, or as recompilations of older CP/M-80 programs. At some software houses, several routes are already in use.

The IBM PC is obviously the most important market for any MS-DOS program. But, as the number of other MS-DOS machines continues to climb, many software developers report they are developing program versions that are not tied specifically to the IBM.

"I'd say just over 50 percent of our PC-DOS programs also come in MS-DOS right now," reports Edward Currie, president of Lifeboat Associates. "This includes most of the spreadsheets, word processors, editors, sort routines, encryption routines, database managers, communications packages, and some utilities.

"But, a lot of products rely heavily on

screen graphics that are not available on MS-DOS. If they do come in an MS-DOS version, it's for a particular machine or market."

Digital Marketing, of Walnut Creek, California, sees the same trend. "Virtually all our PC-DOS programs are also available in MS-DOS," says Hal Miller.

That's also the word from software developers. For example, at MicroPro International, the official position is "If we don't have it for MS-DOS, we will soon. We've already done MS-DOS vanilla versions of Wordstar, Mailmerge, and Supersort, and more are in the works."

Like most software houses, MicroPro reports that, although the plain MS-DOS market is a small fraction of the size of the PC-DOS market, it is growing and is large enough to support, in addition, contracts from manufacturers of several 16-bit machines, incompatible with the IBM PC, have pushed some other versions of MS-DOS high up on the priority list. —S.R.

enough to replace the use of minicomputers or corporate mainframes in many applications, and economical enough to fit into a department's budget.

Seattle Computer, Lomas, and Computer House representatives all cite sales to software houses as an important market. Because the S-100 machines are significantly faster, software developers can compile larger programs and revise them more often, thereby increasing the speed of product development.

In fact, several software houses privately admit that they do much of their initial IBM PC software development work on fast S-100 systems. Once all the other parts of the program are debugged, the software is downloaded to an IBM PC to develop the screen and keyboard interfaces and do final debugging.

Claims of higher speed for S-100 machines are not just dealer hype, either. The S-100 machines have quicker machine cycles, wider data paths, and speedier disks.

The IBM PC runs at slightly under 5 million internal machine cycles per second (a 4.77 MHz clock rate). The slowest of the S-100 machines can do 8 million comfortably, and many users have no problem running some machines faster than 10 million cycles per second.

Most of the S-100 machines also use the 8086 with its 16-bit data paths. Although internally the same as the 8088 used in the IBM PC, the 8086 can access twice as much information each time it reads or writes to memory. This speeds up processing considerably. The improvement is less than two to one, however, because only some instructions need to access more than 8 bits, and other instructions do not require memory access at all.

Flexible Routing

Increased flexibility is the other strong advantage claimed for the S-100 systems. As Rich Lomas sees it, "The advantage of the S-100 bus over a PC is its ability to upgrade easily. For instance, we've got a 286 board, and you'll be able to plug that in and run MS-DOS on it as well, and take advantage of the increased throughput. Whereas if you buy an IBM PC, and you want to run faster, you're out of luck."

Replacement or add-on CPU cards are available for both the IBM PC and S-100 machines, but up to now, the range of pro-

cessors is far wider for the S-100. In addition, the design of the systems seems to allow more room for faster processors to use the S-100 bus.

However, in regard to peripheral cards, it seems the IBM PC's bus may already have the advantage. PC-compatible peripheral cards have proliferated at a rapid rate, and will surpass the S-100 choices in quantity before too long.

The End of the Line?

While the S-100 market is not displaying the phenomenal growth of the IBM PC area, it is not dead yet. People are buying S-100 machines both for their own virtues

and for the similarities with the PC. As it is used more and more on different machines, MS-DOS may prove to be a sufficiently popular operating system to get out from the shadow of PC-DOS.

On the other hand, most S-100 machines don't offer the graphics and the internal code structure of the IBM PC. The PC and its close adherents have a larger software base, more graphics-oriented programs, and an ever-growing range of supporting products.

Each set of machines has particular strengths and limitations. However, to get to many destinations, you could take either bus. /PC

Product Information

The following hardware and software products for S-100 bus systems that operate with MS-DOS are discussed in this article. Please contact the manufacturers for further information.

SB-86 (MS-DOS for CompuPro)

Lifeboat Associates
1651 Third Ave.
New York, NY 10028
(212) 860-0300

List Price: \$200

CIRCLE 626 ON READER SERVICE CARD

MSPRO

Computer House, Inc.
722 B Street
San Rafael, CA 94901
(415) 453-8855

List Price: MS-DOS for CompuPro, \$395;
disk controller for 5¼-inch drives,
\$350

CIRCLE 625 ON READER SERVICE CARD

Gazelle and 8086 CPU Set

Seattle Computer Products
1114 Industry Dr.
Seattle, WA 98188
(800) 426-8936

List Price: Gazelle, \$5,995; 8086 CPU Set
(including 8086, support board with
console ports and EPROM monitor,
and MS-DOS), \$735

CIRCLE 624 ON READER SERVICE CARD

Z-100

Zenith Data Systems Inc.
1000 Milwaukee Ave.
Glenview, IL 60025
(312) 391-8861

List Price: \$2,699 with 128K, one disk
drive, and MS-DOS

CIRCLE 623 ON READER SERVICE CARD

H/Z-100

Heath Company
Benton Harbor, MI 49022
(616) 982-3571

List Price: \$2,199 with 192K, one disk
drive, and MS-DOS

CIRCLE 622 ON READER SERVICE CARD

LDP 72 Floppy Disk Controller and

S100-PC Computer

Lomas Data Products, Inc.
68 Hopkinton Rd.
Westboro, MA 01581
(617) 366-6434

List Price: S100-PC including MS-DOS,
\$2,999; LDP 72 Floppy Disk Controller,
\$275; MS-DOS for LDP 72, \$250 extra

CIRCLE 621 ON READER SERVICE CARD

Why buy an IBM XT when you can buy an IBM PC or compatible, our Pegasus XT Conversion Kit, and save yourself almost \$1,600?

For \$1,295 you can buy our internal 10 megabyte hard disk system installed in an IBM PC or compatible of your choice.

Think about it. When you consider buying an IBM XT or XT look-alike, you're after large storage, the convenience of IBM compatible software, and the peace of mind associated with a quality product. But one thing you're not looking for is paying more than you have to.



The Savings

If you buy an IBM XT, it's going to cost you \$4,995 for the XT system unit. You'll get 10 megabytes of hard disk storage, one 320 Kbytes floppy disk drive, 8 slots, a \$120 asynchronous communication adaptor, 128K of RAM and the three IBM initials.

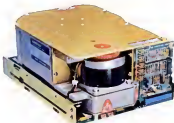
We recommend instead, that you buy the IBM PC for \$2,104. You'll get one 320 Kbyte floppy disk drive, 5 slots, 64K of RAM, the same three IBM initials, a space for your dealer to put the Pegasus XT Conversion Kit, and an extra \$2,891 to buy it with. But since the Pegasus XT Conversion Kit costs only \$1,295 installed, you'll have an extra \$1,596 — almost \$1,600 — left over. With many compatibles you'll have even more.

But if you already own an IBM PC and were thinking you'd just get the

XT expansion chassis, we have a surprise for you. If you add the \$1,295 cost of the Pegasus XT Conversion Kit to the \$2,104 price of an IBM PC, you can have a second computer — instead of a dumb box — for less than the price of the XT expansion chassis.

Hard Disk Quality

Now, before you start thinking that IBM's hard disk is better than ours, remember that IBM doesn't make their own hard disk for the IBM XT. They go into the marketplace, just like we do, and strike the best price they can. If you were to buy an IBM XT, your hard disk might come from one



of four manufacturers. It's possible, in fact, that the IBM XT might have the same hard disk that you'd get in our Pegasus XT Conversion Kit.

The Role of the Controller

But the hard disk is not the whole story. It takes a controller card to get your files from the hard disk to your computer so you can use them.

The IBM XT has a good controller card. Unfortunately, it is not designed to take advantage of some of the ad-

vances in hard disk technology. Our controller card will work with our 10 megabyte hard disk all the way up to our 140 megabyte hard disk — and everything in between. With the IBM XT controller, you're limited to four manufacturers. The Pegasus controller board, on the other hand, configures to whatever hard disk you may want to install in the future. There is virtually no limit on hard disk size or number of manufacturers you can use.



Larger Disks

Pegasus offers an entire line of hard disks. You can expand your IBM PC far beyond the storage of the IBM XT. You can add our 23 megabyte hard disk for only \$1,995, or our 40 megabyte for only \$800 more. And if you really need storage, we offer a 65 and 140 megabyte hard disk that slides right into the same space that IBM and the compatible manufacturers put their 10 megabytes.

So, before you decide to spend more money than you have to, consider the Pegasus XT Conversion Kit. You'll get dealer support, the same 90 day warranty IBM gives, and have enough money left over to buy one of our larger hard disks. And isn't larger storage why you were looking at the hard disk in the first place? Contact your computer dealer today.



PEGASUS

2200 West Higgins Road • Suite 245
Hoffman Estates, IL 60135 • (312) 843-1090

Dealer inquiries invited.

IBM is a registered trademark of International Business Machines, Inc. XT Conversion Kit is a trademark of Pegasus.

CIRCLE 313 ON READER SERVICE CARD



For users of Apple, IBM, TRS/80, Atari, Commodore, Texas Instruments, and other brand name computers:

Here's the easiest way to buy quality diskettes at discount prices

Now you can get error-free double density diskettes by IBM, Control Data, Maxell and Verbatim delivered to your door. For some of the lowest prices around.

You save because we ship huge volumes of magnetic media in boxes of 10.

To order, use this form.

For even faster service, call toll-free.

1-(800)-FLOPPYS or

1-(800)-521-5700

Michigan • 1-800-482-4770

Canada • 1-800-265-4824

Alaska/Hawaii • 1-800-821-9029

ALL MAJOR CREDIT CARDS ACCEPTED

Shipping & handling F.O.B. Southfield

Transaction Storage Systems Inc., Southfield, MI



Size	IBM	Qty	Verbatim	Qty	Control Data	Qty	Maxell	Qty
5-1/4" SS	24.90		23.90		19.90		28.90	
5-1/4" DS	39.90		34.90		29.90		41.90	
8" SS	24.90		—		19.90		—	
8" DS	39.90		—		29.90		—	
Sub Totals	\$		\$		\$		\$	
Name _____ Title _____								
Company _____								
Address _____								
City _____ State _____ Zip _____								
<input type="checkbox"/> AMEX <input type="checkbox"/> MASTERCARD <input type="checkbox"/> VISA								
Card # _____ Exp. Date _____								
Shipping & handling 1-6 boxes add \$4.00 per order								
7 or more add \$6.00 per order.								
Clip and mail today to: Transaction Storage Systems, Inc.,								
22255 Greenfield Road, Southfield, MI 48075								

EXPECT A MIRACLE

CIRCLE 593 ON READER SERVICE CARD

PC owners will be able to share in the excitement of videodisk technology as early as next year. What's in store? For starters, brilliant images on wall-sized plasma screens, crystal-clear audio, and interactive simulation with cinematic effects.

There's A Videodisk In Your PC's Future

Imagine your den transformed into a media room of awesome capabilities just waiting for your interactive commands. You sit down at the keyboard of your IBM Personal Computer and power up the whole entertainment center at once. The plasma screen wall in front of you flickers on, and soon you're engrossed in an interactive simulation game with cinematic effects that transport you to faraway adventures. You're surrounded by crystal-clear audio enhancing the believability of the simulation. Of course, you still have to remember to keep the volume down so as not to disturb the rest of the household.

Right now, entertainment systems are being designed that will enable videodisk players, compact digital audio players, stereo systems, projection and plasma TV displays—all in gorgeous color and breathtaking sound—to work with the IBM PC.

Within the next year, you'll be able to hook up your PC to a videodisk player and interact with realistic games that will make the computer game of today seem like a throwback to the Stone Age. Real movie footage will replace crude computer display graphics. High-quality digital sound from your stereo will replace the tinny squeaks of the PC speaker. Wall-

sized high-resolution images will dwarf the 12-inch display screen. The PC will become the heart of an entertainment center that will far outstrip anything you have ever experienced in a movie theater.

With a laserdisk player connected to your PC, you will be able to "travel" anywhere in the world, "sit" at the control

A LASER
videodisk player can
independently access
any one of 108,000
frames on a videodisk.

panel of the space shuttle, "visit" colleges, or "walk" through a haunted house. One day in the not-too-distant future, people will be criticized for spending too much time interacting with their entertainment screens instead of with their families and human friends.

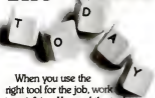
Interactive laserdisk games are popping up in arcades all over the country

introducing people to the interactive video revolution. And very soon, that same technology is going to begin appearing in homes. What many PC owners don't realize is that they don't have to wait years for all this to happen. They can enjoy interactive videodisk adventures with existing equipment. Several consumer and industrial videodisk players are currently available, and there are interfaces that make the players work with the IBM PC. This means that for less than the cost of a 10 megabyte hard disk, you can have an interactive videodisk system tied to your PC.

"So what?" you ask. Admittedly, there isn't much software right now in the form of videodisks and floppy disks to accommodate this type of system, but within a short time, there will be an explosion of activity in this field. One of the major reasons is that a laser videodisk player can independently access any one of 108,000 frames on a videodisk. These frames can be pages of a directory, such as a phone book, or they can be slides and home movies, or, if you're taking a trip, they can be a road map to your destination. The applications are limited only by your imagination.

In addition, a digital videodisk has a potential memory storage capacity in giga-

Stroke The Dvorak



When you use the right tool for the job, work is satisfying. You and the tool work together. You get the job done right, and you feel a sense of achievement.

But the wrong tool works against you. You manage to get things done, but it's uphill all the way. You're left frustrated and tired.

Today's standard key layout is deliberately hard to use. Devised to keep 19th-century mechanical machines from jamming, it constantly works against you. The result — fatigue and errors.

What's the right tool for communicating with your PC? The Dvorak keyboard. Its natural key layout works with you, giving you the feel of ease and comfort. Your personal productivity rises.

SureStroke is the total Dvorak keyboard solution for the IBM PC. More than a key-mapper, SureStroke powers you as you learn the Dvorak layout. Harnesses your unconscious resources. Gets you up to speed fast.

Get SureStroke. And stroke the Dvorak — today.

SureStroke includes

- key-mapping software •
- press-on letters for keys •
- audio cassette •
- learning software •
- complete manual •

SureStroke for IBM PC with PC-DOS. \$49.95 U.S. plus \$3.95 shipping. Send your name, address, Visa or Mastercard number and expiration date (or company check) to:

Seasoned Systems, Inc.
Box 3036, Dept. PC-11
Chapel Hill, NC 27515
or call 800/334-5531, toll-free.
In NC, 919/967-5818

**SEASONED
SYSTEMS**

IBM is a trademark of International Business Machines Corp.

CIRCLE 377 ON READER SERVICE CARD

bytes (billions of bytes). You can be sure that all the heavy hitters in the memory storage business are hard at work making an optical videodisk device that can handle these huge amounts of memory at an affordable price.

The largest drawback to the optical videodisk is its inability to record and play back information in a way that's cost effective. But there isn't much doubt that 2 years from now, viable read/record videodisks will be available to the computer-using masses. In the meantime, manufacturers are experimenting with fixed database delivery systems using premastered optical disks.

A Range of Applications

Unknown to the general personal-computing public, videodisks hooked up to computers are being used with ever-growing frequency by corporations interested in having a more effective means of training their sales forces and employees. It has also proven to be enormously effective in teaching and evaluating students in educational applications. And libraries are already transferring vast numbers of books and large amounts of research information onto videodisks for easy access. Sears even put its enormous retail catalog on videodisk (See PC Magazine, Volume 2 Number 3, "Coming Attraction: The Super Video Instructor.")

Last year's World's Fair in Knoxville, Tennessee, used an array of videodisk

players hooked up to computerized touch screens to inform visitors about everything from energy conservation to how to find the nearest restrooms. Viewers in one exhibit hall could direct the course of a video debate by touching the image on the TV screen of the panelists they wanted to hear.

THE TOUCH
screens can sense the difference between a human finger and a misplaced ice cream cone pressing on the screen.

The largest installation of videodisk players for public use is in Epcot Center at DisneyWorld in Florida. There, hundreds of interactive videodisks, controlled in tandem, educate and entertain visitors. Of course, the Disney people have thought of everything: the touch screens can sense the difference between a human finger and a misplaced ice cream cone pressing on the screen.

The government is actually the largest user of videodisks, since the technology



Panasonic Optical Document File System

lends itself so well to defense training and contingency simulation. When you hear about the "boys at the Pentagon" playing war games, you can be sure they're looking at videodisk images, not mere graphs on their display screens. They've found videodisks to be the perfect way to train soldiers in the operation of sophisticated electronics and land vehicles, such as tanks, without the risk of accidents. In fact, the Defense Department is the number-one funder of research pertaining to videodisk interactivity.

THE *Defense Department is the number-one funder of research pertaining to videodisk interactivity.*

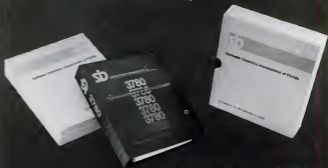
Local governments also are getting involved with videodisks. The city of Rochester, New York commissioned a set of videodisks that documents each residential property within city boundaries. Residents there soon will be able to go to the nearest office of their Bureau of Assessments and access a video image of their home, along with all the pertinent data about its property appraisal. This is a test usage of a video/database system that other cities might also employ.

Anyone who has ever gone into an IBM Product Center has probably seen interactive videodisk technology at work. Big Blue decided that a customer information card displaying the PC and its virtues on a video screen was the best way to help its salespeople handle questions from anxious customers. In fact, IBM used to be in the videodisk business. It went into partnership with another company to develop and sell lesser videodisk technology. But for some reason—it was rumored to be poor management—IBM got out of the videodisk business a few years ago. Since then, lesardisks have flourished: proof that IBM's judgment is not infallible.

Videodisc Players

To set up your own interactive videodisk system, you'll need, in addition to

Software Dynamics, Inc. Introduces ... **SDI-3780 & SDI-2780**



IBM Terminal Emulators for the IBM Personal Computer.

MAJOR FEATURES:

- Order SDI-3780 and get SDI-2780 at no additional cost.
- SDI-3780 emulates all features and functions of the IBM 3780 RJE Workstation with the exception of Home Mode and On-line Test Mode.
- SDI-2780 emulates all features and functions of the IBM 2780 RJE Workstation with the exception of Six-Bit Transcode, Synchronous Clock feature and Off-Line Operation.
- Compatible with the IBM BISYNC communications adapter, the Micro Synargy MPCC adapter and the AST CC-232/332 adapters.
- Supports both point-to-point and multipoint data link procedures at line speeds up to 9600 bits per second.
- Talks standard 3780/2780 to your host computer and to other mini's and micro's emulating the IBM 3780/2780.
- A special mode allows transfer of program files and other unstructured files between your IBM PC and other mini's and micro's with compatible SDI emulators.
- Supports both color and black/white monitors.
- Total unattended operation is available via diskette resident batch command files. These files can even be downloaded from your host computer and then executed by SDI-3780/2780.

ABOUT SOFTWARE DYNAMICS, INC.

At SDI, communications is our only business and has been for the past 15 years. We've authored IBM terminal emulators for some of the best known mini's and micro's in the industry. Because we develop and support all of our own products, we can give you quality and responsiveness.

Watch for our IBM 3274-51C emulator scheduled for release in January 84.

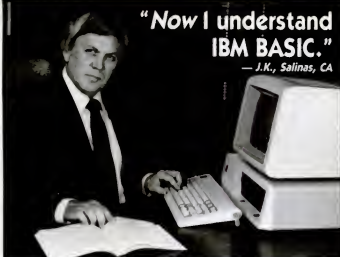
IBM is a trademark of International Business Machines.



Software Dynamics Incorporated
P.O. Box 247 • Dunedin, Florida 34296-0247 • (813) 733-8784

**"Now I understand
IBM BASIC."**

— J.K., Salinas, CA



From A Proven Teacher Of The Language

LEARNING IBM BASIC for the Personal Computer by David A. Lien is the key to:

- mastery of the BASIC language
- writing your own software
- enjoying your computer

426 pages

Call or write



CompuSoft® Publishing
535 Broadway, Dept. 011183
El Cajon, CA 92021
619-588-0996 800-854-6505

Please allow 4 to 6 weeks for delivery.

GUARANTEE

If you're not totally satisfied, return the book in salable condition within 30 days for a refund of the purchase price.

Please send _____ copies of **Learning IBM BASIC** at \$19.95 each.
(Calif. residents add 6% sales tax) plus \$2.00 shipping and handling per book
within the U.S. Foreign orders, payable in U.S. dollars on a U.S. bank, include
\$3.00 surface shipping and handling per book.

Total Enclosed _____ Name _____

Address _____

City/State/Zip _____

☐ Check

☐ Visa

☐ MasterCard

Account # _____

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

--	--	--	--

Expiration Date

Signature _____



011183

CIRCLE 231 ON READER SERVICE CARD

MOST
*interactive programming
encourages the user to
treat the disk as a
reference book rather
than as a sit-still-and-
watch TV show with a
strictly sequenced plot.*

your PC, a videodisk player, some sort of interface between the two units, and a few interactive videodisks.

Let's start by looking at the videodisk player. The major manufacturers of videodisk players are Pioneer, Sony, RCA, and Philips/Magnavox. All are familiar names from the world of stereos and TVs. You may find equipment put out by these primary manufacturers on the market under trade names other than those of the original producers.

All videodisk players available in the United States fall into one of two categories: laser videodisks or capacitance electronic disks (CED).

Laser Videodisks

Since a laser videodisk offers 108,000 individually addressable frames it can store anything from pages in a book to your favorite slides, to step-by-step demonstrations of a task, such as fixing a bike. Laserdisks have the special ability to store sequences in compressed time and then display them in real time using a variable slow-motion feature. This compressed-time storage feature enables a disk to contain more information on it than the stated capacity of 30 minutes per side in interactive mode.

The real beauty of a videodisk lies in its ability to free us from the linear form of television programming. A user can hop from any point to any point on the disk in a matter of seconds. Most interactive programming encourages the user to treat the disk as a reference book rather than as a sit-still-and-watch TV show with a strictly sequenced plot. Instead of trudging through from start to finish, the user can go directly to the areas of interest.

Individual frame numbers are accessed via a remote-control keypad. The remote controller can put the videodisk player into various modes, such as fast forward, scan, and still/step, in either forward or reverse direction. Also, any individual frame can be called up and displayed for a minute, an hour, a day, or a week with no chance of damaging or wearing down the disk. Contrast this to home videocassette players, with which parking in "still mode" for only 30 seconds can tear a hole through the tape. The "still mode" capa-

bility of the videodisk player is made possible by the fact that nothing comes in physical contact with the videodisk except for a beam of laser light that reads tiny indentations pressed into the clear plastic record. These "micro-pits" contain the information to produce a video image far superior to that of any home videocassette player. And the audio quality is derived from the same technology that gave us the compact digital audio disk, which will soon make obsolete the black vinyl records we now use.

Videodisks In The Office

Going a step beyond the word processor, the digital optical-memory disk recorder can store all the material you receive.

Digital OMDR Optical Disc Player Recorder

Panasonic Industrial Co.

Ona Panasonic Way

Secaucus, NJ 07094

(201) 348-7183

List Price: \$35,000 (est.)

Requires: Compatible with PC for data storage. Interfacing specifications still being developed.

CIRCLE 642 ON READER SERVICE CARD

There's no doubt that word processing has already changed the way things are done in the office. You, or the people you work with, may use word processing to create every letter, report, or memo. That's fine for the materials you generate, but what about all the information that comes into the office? Presently, the great majority of those letters, reports, and memos still exists in paper form that typically clutters the work environment.

Wouldn't it be great to have a way to reduce all that paper-based information into electronically-stored data that can be integrated and managed in the same way you work with your self-generated information?

Well, Panasonic has come up with the answer. It has just introduced a complete office system that can optically store up to 10,000 letter-size documents on a special 8-inch disk. A single semiconductor laser "shades" information on a thin film of tellurium-oxide for one-time use. This method, called Direct Read After Write

(DRAW) enables immediate access to stored information, unlike microfilm or microfiche systems, which require time to process the film.

Letters, pages of a report, or any printed matter can be stored in the digital optical-memory disk recorder by using a scanner to input character information. The documents can then be called up on a monitor, printed, or sent and received by facsimile. That way, a document need never exist in any form other than in the disk's memory. Whenever you want a copy of that particular document, all you need do is go to the copier and print one—or a hundred. In addition, the recorder will accept digital data from a computer, video still-frames, and even X rays.

It takes less than half a second to retrieve data on the 8-inch disk, which has a memory capacity of 700 megabytes, and soon the disks will have the capability of repeated recordings.

Sony soon will be introducing a DRAW system of its own that will be capable of using its existing LDP-1000 laserdisk player to read its recordable disks. This will certainly help to make read/write laserdisks more affordable and will allow those people who already have a Sony player to make use of the new technology.

Several other companies, among them McDonnell-Douglas, Teac, and RCA, are working on optical recording systems of their own. In the next few years, a flurry of activity in this field will make metal filing cabinets, hanging file folders, and trees much less useful in the office. —A.S.

SCIENTIFIC SOLUTIONS

With the IBM PC*

Sourceware offers you precision software for critical applications where accuracy is of prime importance. Our scientific applications are developed exclusively for Intel's 8087 numeric coprocessor using concurrent assembly language programming techniques to assure you of speed and accuracy.

REGRESSION PLUS™

A versatile least squares application for demanding engineering and scientific problems. Modified Gram-Schmidt decomposition and extended precision provide exceptional accuracy. This program is designed to handle ill-conditioned equations. Regression, polynomial fits, weighted least squares, and constrained coefficients are handled easily. Can be used also to compute exact solutions to simultaneous linear equations and inverses. Separate data entry program provides editing and data transformation capability. Requires Intel 8087 numeric coprocessor, 192K, DOS 2.0, printer, 80 column display, and disk drive.

PRICE \$695

FORTRAN PAK™ PASCAL PAK™

Our packages give you screen control functions not provided in Pascal or FORTRAN. With FORTRAN PAK and PASCAL PAK you can develop flexible, interactive software that enhances any application. You can clear and scroll the screen, control the cursor, access color and graphics, set text attributes, determine video modes, switch monitors, and much more. Both packages are written in Assembly language to perform quickly and efficiently. Demonstration programs and thorough documentation are included. Requires DOS 1.0, 1.1 or 2.0.

PRICE \$75 each

ASSEMBLY SOURCE CODE INCLUDED

SOURCEWARE

1400 East 55th Place
Suite 512
Chicago, Illinois 60637
312-995-4539

☐ VISA ☐ MASTERCARD

*Registered trademark of International Business Machines Corporation.

Various Videodisk Models

Buying a videodisk player is like buying any other peripheral: the more it costs, the more it'll do. Pioneer used to sell a computer-compatible videodisk player, the VP1000, for a mere \$400. Alas, Pioneer no longer sells that model, and the consumer unit they replaced it with, the LD-1100, is virtually the same machine in a more attractive housing. But not exactly the same, since Pioneer didn't provide the stereo mini-jack that enables the PC to hook up to the videodisk player. In any case, Pioneer now has an awkward coupler to try to make up for their oversight, but I don't recommend it.

Magnavox has a consumer player, the VC8010, which looks almost identical to the Pioneer unit, has the same inner workings as the LD-1100, and yes, it even has the all-important remote jack (see Figure 1). What's better is that the 8010 sells for \$749 or less, depending on the deal you're able to get. At the moment, the Magnavox unit is definitely the best buy for your



Figure 1: The Magnavox Videodisc Player, MAGNAVISION, Model VC8010GY.

NOW YOU CAN GIVE YOUR IBM PERSONAL COMPUTER A VOICE OF ITS OWN.

With SMC's PC TALKER™ board, your IBM® personal computer can actually talk to you. Simply plug this low-cost speech synthesizer into any IBM-PC board slot and it will provide complete speech through an external speaker. What's more, you can create an unlimited vocabulary through a BASIC program. With PC TALKER, your computer continues to provide useful information even when your eyes aren't on the screen. It also lets you create and play video games that have speech capability. SMC's PC TALKER! You have to hear it to believe it. For more information, contact Standard Microsystems Corporation, 35 Marcus Boulevard, Hauppauge, NY 11788 (516) 273-3100.

Henry, you
made a mistake.
Go to file 3...

**STANDARD MICROSYSTEMS.
THE ONE TO WATCH.**

IBM® is a trademark of the International Business Machine Corporation



CIRCLE 584 ON READER SERVICE CARD

PC MAGAZINE 636 NOVEMBER 1983

Interface Comparison Chart

Company/ Product	Compatible Players	Features	Software	Video Display Software Switchable	Notes	Retail Price	
Allen Communications Universal Video Controller	All laserdisk players	Control of several videodisk or videotape machines simultaneously. Also accepts four audio sources, graphics overlay on Profeel monitor.	Controlling software. Simple commands.	Yes	This is an Industrial model with lots of options. Wonderful if you can afford it.	\$1,200	CIRCLE 641 ON READER SERVICE CARD
Digital Controls, Inc. Red Max	All laserdisk players.	Many of the same features as the UVC above. Allows three different computers to interface simultaneously. Two players controlled.	Controlling software. Simple commands. Can program.	Yes	Extremely capable device at a reasonable price. The one to get for serious playing.	\$855	CIRCLE 640 ON READER SERVICE CARD
Interactive Research Corporation Serial Card Jumper Mod	Magnavox VC8010 PR 8210 and other industrial models.	Extreme simplicity. Low cost	Has a whole line of interactive software coming out.	Yes	Information on installing the jumper can be obtained from the company. No details on software yet.	Undetermined (very low cost)	CIRCLE 639 ON READER SERVICE CARD
New Media Graphics Discmaster 1000	Magnavox VC8010 PR8210 VP1000 LD-1100 w/adaptor. Any other unit with a mini-jack plug	Very simple interface. Works with consumer players.	No. You have to come up with your own software to make it run.	No	This is the most affordable, simplest interface presently available. Comes closest to being a consumer model. Lacks software.	\$395	CIRCLE 638 ON READER SERVICE CARD
On Line Computers Interface	PR8210 and other industrial models.	Touch screen, joy stick capabilities.	Pilot Plus An easy and complete authoring language designed for use with videodisk players.	Yes	This interface was developed for in-house industrial uses and is just being made available to consumers. The software is important and can be used on a variety of players.	\$350 (est.) Software separately \$190	CIRCLE 637 ON READER SERVICE CARD
Pioneer IF-1000	Universal for laserdisk players with a remote control mini- jack	Extreme simplicity. Transparent use.	Simple commands. No authoring provisions.	Yes	This unit is still in the prototype stage with no definite plans for release.	Undetermined (low)	CIRCLE 636 ON READER SERVICE CARD
RCA and Licensees Interactive Interface	SelectaVision 400	Complete control of player via complex communication.	Under develop- ment. Written in FORTH. No plans for release. One-word commands.	Yes	RCA has developed a very simple interface for the PC, which would cost little to produce, but both the software and interface are not available yet.	Undetermined (low)	CIRCLE 635 ON READER SERVICE CARD
Sony Serial Interface	LDP-1000	Actually not an interface, but a "null modem" serial cable.	Sony uses Pilot Plus (see On Line Computing for details).	Yes	Not really an interface at all, since it is just an RS-232 cable between the machines.	Undetermined	CIRCLE 634 ON READER SERVICE CARD

THE
Pioneer PR8210 is so
popular that it's hard to
find one to buy.

money. You'll be able to get a start in interactive video for a modest investment.

Among industrial models, Pioneer has a very nice player for \$845 (see Figure 2). The Pioneer PR8210 is increasingly the standard model for which interfaces for industrial applications are being designed. It offers a high level of interactive communication and durable components in a very nonindustrial-styled shell. This unit is so popular that it's hard to find one to buy, especially since the PR8210 can be obtained only from Pioneer Video.

The Porsche of the videodisk world is the Sony LDP-1000, which is shown in Figure 3. Since the Sony unit has an on-



Figure 2: Pioneer LaserDisc Player PR8210.

board microprocessor built in the question is, "What can't it do?" When hooked up to a PC, it can put the user in interactive ecstasy, but with a hefty price tag of

about \$3,000. You could buy another PC for almost that much. Because the Sony player is a high-level industrial model, it can communicate fully with the PC.

**computer
case
company**

WE MAKE A GREAT CASE FOR YOUR IBM.

CALL TOLL FREE: (800) 848-7548



IB501

One size does not fit all. Our cases are designed for specific hardware configurations. When you put your computer in our case, it fits hand-in-glove. Once your equipment is safely inside the attache-style carrying case, it never has to be taken out again. To operate, simply remove the lid and connect the power. To store your computer, disconnect the power, enclose your disks, working papers, and manuals in the compartments provided, and attach the lid. It's as easy as that.

- AP106 Amdek Color I, II or III Monitor 119
- P401 Paper Tiger Printer (400/445/460) 99
- P402 Centronics 730/737 & Radio Shack Printer 89
- P403 Epson MX70 or MX80, Microline 82A Printer or Color Computer 89
- P404 Epson MX100 Printer 99
- P405 IGS 560 or Prism 132 Printer 109
- P406 C. Itoh Starwriter Printmaster F-10 Printer 119
- P407 Okidata Microline 83A or 84 Printer 99
- P408 C. Itoh Prowriter 2 Printer 99
- P409 C. Itoh Prowriter (Apple Dot Matrix) or NEC PC8023 Printer 89
- IB501 IBM Personal Computer with Keyboard 129
- IB502 IBM Monochrome Monitor 99
- CC50 Case Carl 79
- CC80 Matching Attache Case (5") 85
- CC90 Matching Attache Case (3") 75
- CC91 Matching Accessories Case (5 1/4" Diskettes, Paper, etc.) 85
- CC92 5.25" Diskette Case (Holds 75 Diskettes) 49

Computer Case Company, 5650 Indian Mound Court, Columbus, Ohio 43213 (614) 868-9464

CIRCLE 24 ON READER SERVICE CARD

PHILIPS
was the company that
developed laserdisk
technology.

North American Philips (the people who bring you Norelco and Magnavox products) was the company that developed laserdisk technology, which it then licensed to Pioneer. Philips has a laserdisk line of its own, but only on the industrial side of the counter. It will soon be introducing a model, the VP825, which is specifically designed for computer integration. The player works beautifully with the PC. If you can manage to get hold of an 825 player after its introduction next year, you'll have to pay about \$1,300 for the privilege of owning it. Even at that price, though, the 825 will be the least expensive laserdisk available that is capable of providing sophisticated communication between the player and the PC via its direct-



Figure 3: Sony Model LDP-1000 Player.

connect serial port.

Nearly everyone has seen an RCA videodisk in action at the local video or department store, and many people have the unit at home. Although the RCA player has proven to be popular with the home video crowd, its entire format, based on a stylus system similar to record technology, has proven limiting.

CED Videodisks

CED videodisks are too sensitive to be handled, and so must be held in protective plastic housings. The player extracts the disk from the housing when the whole assembly is inserted into the player. Instead of frames, the CED system works on the basis of TV picture "fields." Location on the disk is referred to in terms of

Videodisk Players Comparison Chart

Company/Product	Format	Consumer or Industrial	Type of Interfacing Port	Playing Time/Storage Capacity per Side	Notes	Retail Price	
Magnavox VC8010 (same as Sylvania VP7200)	Laser	Consumer	Stereo mini-jack (simple)	30 minutes/54,000 frames	Full-featured consumer model. Best buy for the money. Simple computer interaction via various interfaces.	\$749.95	CIRCLE 633 ON READER SERVICE CARD
Philips VP832	Laser	Industrial	RS-232C (complex)	30 minutes/54,000 frames	Least expensive sophisticated player. Won't be available until next year. Very computer friendly. Direct-connect serial port.	\$1,300.00 (est.)	CIRCLE 632 ON READER SERVICE CARD
Pioneer PR8210	Laser	Industrial	Serial mini-jack (semi-complex)	30 minutes/54,000 frames	Low cost industrial model. More interfaces available than for consumer models. More durable than consumer models.	\$845.00	CIRCLE 631 ON READER SERVICE CARD
LD-1100	Laser	Consumer	No direct provision. Has optional optical interface. (simple)	30 Minutes/54,000 frames	Awkward interfacing. Not good for interactive uses.	\$800.00	CIRCLE 630 ON READER SERVICE CARD
RCA (and Licensees) SelectaVision SJ7400	CED	Consumer	RCA jack (complex)	60 Minutes/27,000 still-field grooves	Has many sophisticated features. Highly computer friendly. Limited format capabilities.	\$500.00 (est.)	CIRCLE 629 ON READER SERVICE CARD
Sony LDP-1000	Laser	Industrial	RS-232C Port (complex) Also 1K on-board user RAM	30 Minutes/54,000 frames	Incredibly features-packed. On-board microprocessor. Very computer compatible. Super sophisticated unit. Direct-connect serial port	\$3,100.00	CIRCLE 628 ON READER SERVICE CARD

INTRODUCING THE INDEPENDENT GUIDE TO PRODUCTS, SERVICES, PERIPHERALS AND SUPPORT ITEMS FOR YOUR IBM PC OR XT



With literally thousands of different products on the market that

are compatible with your IBM PC or XT, how do you find the ones you need? How do you decide which ones are best for you?

With PC Buyers Guide—over 500 pages of listings for IBM-compatible hardware, software and services—from the publishers of PC Magazine.

Every product is fully and accurately described. You'll know what it is, what it does, how much it costs, and what level of skill is required—novice, intermediate or technical.

And in addition to PC hardware and software, you'll get details on all the important extras such as accessories, furniture, books, and consultants.

To order your copy of PC Buyers Guide, simply fill in the coupon below and mail it today.

Mail to:

PC BUYERS GUIDE

CN 1914, Morristown, NJ 07960

Please send me _____ copy(ies) of PC Buyers Guide. I enclose \$7.95* for each copy, plus \$1.50 for postage and handling.

Outside the U.S.A., the price is \$10.00; send U.S. Funds only. *Residents of CA, CO, CT, DC, FL, IL, MI, MA, MD, NJ, NY State and VT add applicable sales tax.

Name _____ (please print)

Address _____

City _____

State _____ Zip _____

NGAC

time rather than frame numbers. The time reference is more familiar to the average consumer: you can ask the player to find the 23-minute mark in a program, rather than having to juggle frame numbers (such as 29,371), which are accurate but not very easy to use.

Also, the CED system lets you tag a segment of a disk with invisible "flags," allowing you to program unlimited repeats of favorite segments in various combinations.

RCA is now introducing its new line of videodisk players that incorporate interactive capabilities for the first time. The array of commands at your disposal is impressive, and RCA has made provisions for interfacing the PC. There are certain advantages to the CED system, such as 2 full hours of interactive capacity per disk,

but when compared with the laserdisk technology, CED disks still come out far behind.

There are several other companies that market videodisk players, such as Sylvania, Hitachi, and Toshiba. New models continue to come out, and they should be compared to those currently available, detail for detail, before you buy. The most important question to ask is, "Can it be hooked up to my computer?"

Interfaces

The interface resembles modem technology, and like a modem, it can come in either a plug-in board variety or as a "black box" intermediary connected between the two machines. Typically, the interface needs a standard RS-232C port on the back of the PC to hook up to, and a

How A Laserdisk Player Works

The laserdisk player utilizes the unique capacity of the laser beam to access the disk at any point you choose.

The way a laserdisk player works is quite amazing. You'd swear it's straight out of some sci-fi film, but no, videodisks are here today—and they work beautifully.

A small, very low-power laser inside the player shoots out a beam of laser light that travels through a series of lenses and mirrors until it is directed straight up into

forming the patterns that are read by the laser beam. This hill-and-valley landscape contains everything within it to let the player know just what video image to produce and which frame and chapter is being read. It even can contain digital programming date, which some players are designed to interpret.

The information, now encoded within the laser beam, is reflected back into the objective lens. The beam then continues down a parallel path to the one it came on and eventually is split off in another direction. A light-sensitive photodiode call translates this reflected beam's pattern into a bright, sharp video image that can be viewed on any regular TV screen.

The laser beam can be directed to any point on the disk, and in a few seconds can traverse the disk to any other point. This enables the player to find a specified frame almost instantly.

When the PC controls a videodisk player, it sends out 8-bit strings of ASCII code, much as it would when conversing with a modem. The code is interpreted by an interface, or the player itself, and turned into machine-code orders that can be recognized and performed. Higher-level players send back signals to the PC, letting the computer know that it has carried out

THE LASER
*beam can be directed to
any point on the disk,
and in a few seconds
can traverse the disk to
any other point.*

the chamber that houses the videodisk.

The objective lens glides underneath the disk and focuses the laser beam up at the silver-colored platter, which rotates at 1,800 RPMs. The disk itself is said to be virtually indestructible and supposedly will retain its image clarity forever.

The surface of the disk contains millions of tiny "micro-pit" indentations

THE PIONEER

universal interface will be the one to get if you're looking for simple, inexpensive, interactive applications.

matching RS-232C port on the back of the videodisk player. Since some player models have a mini-jack connection instead, there are provisions to accommodate their hook-ups as well.

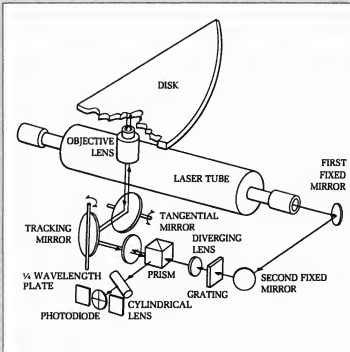
The way your PC interfaces with the

videodisk player is really marvelously simple. By emulating the player's infrared remote control unit, the PC can take control of the videodisk player. It can make the player stop, start, scan around the disk, locate any frame, and hold on to it for as long as you want. The feeling of power can be quite heady. Depending on the type of videodisk player being used, the communication between the player and the PC can be either very basic (send only), as is the case with my VP1000, or the conversation can go in both directions (send and acknowledge), which is why those sophisticated industrial models cost so much. To have a good level of interaction, it's important for the computer to be constantly apprised of what the videodisk player is doing—the acknowledged signal performs just that function. Before the two ma-

the orders and is ready for more instructions. The player can also keep the PC constantly apprised of which of its functions are being used and what it is

doing at all times. This is termed "hand-shaking" communication, and simply means that the PC and the videodisk player were meant for each other. —A.S.

An illustration of the lens-mirror system of a laser videodisk player showing the path of the laser light reflected from the indentations on the disk.



chines are able to speak to each other, though, the PC needs to have some sort of operating program to define their means of interaction. Here is the weak link in this state-of-the-art technology.

The PC, when properly configured, starts to spew out strings of commands via its serial interface. The player picks up on these commands and carries out the orders. The commands are usually generated in machine language, and then translated into manageable form for the user to put together in a programmed sequence. The key to interactive happiness is the computer program that drives the interface. If it's easy to use, then you're set. But if it's not, then you could be in for a nightmare. One interface manufacturer leaves it up to the user to write the program that will make its product work on the PC. For some, this task is no harder than walking a dog, but for others, forget it. There are those of us who want to be able to plug that interface in, insert the floppy-disk program, and be off and running. Luckily, most interface manufacturers provide guidance in this area, and there are even a few interfaces with very versatile programs.

One group of interfaces will work on any laserdisk player with the remote stereo mini-jack. The New Media Graphics interface is such a unit. One plug goes into the back of the laserdisk player, and the serial connector hooks up to the serial port of your PC. The player is controlled through simple one-letter abbreviations. P means play, and the command string PW 300 W+ means play, wait 300 frames (about 10 seconds), then step forward. Simple, right? Except that New Media Graphics expects PC users to configure their serial ports and write basic programs of their own to execute these simple commands. At \$395, though, it's one of the least expensive interfaces—if, and only if, you're good at programming.

Pioneer has a prototype of a universal interface that will be out soon. It'll work with any laserdisk player that has a remote control jack and any microcomputer with a Centronics printer port. The best news of all is that it will sell for a very modest sum. The programming will probably amount to one-letter commands, which the New Media Graphics model also uses. This will be the one to get if you're looking for simple, inexpensive, interactive applications.

Videodisk Players

Videodisk players come with a variety of features and in a wide price range.

Mognovox VC8010 Laserdisc Player or
Sylvania VP7200 Player

NAP Consumer Electronics Corp.
Interstate 40 & Straw Plains Pike
P.O. Box 6950
Knoxville, TN 37914
(615) 521-4498

List Price: \$749.95 each

Requires: Serial port, interface.

CIRCLE 457 ON READER SERVICE CARD

VPB32 Player

North American Philips Corp.
Optical Videodisc Systems
100 East 42nd St.
New York, NY 10017
(212) 850-5075

List Price: \$1,300 (est.)

Requires: Serial port, interface.

CIRCLE 456 ON READER SERVICE CARD

PR8210 & LD-1100 Players

Pioneer Video, Inc.
200 West Grand Ave.
Montvale, NJ 07645
(201) 573-1122

List Price: Players PR 8210 = \$845

LD 1100 = \$800

Requires: Serial port, interface.

CIRCLE 455 ON READER SERVICE CARD

SelectaVision SFT400 Player

RCA Laboratories
Videodisc Player Control Research
Princeton, NJ 08540
(609) 734-2726

List Price: \$500 (est.)

Requires: Serial port, interface.

CIRCLE 454 ON READER SERVICE CARD

LDI-1000 Player

SONY Communications Products Co.
Sony Drive
Park Ridge, NJ 07656
(201) 930-8106

List Price: \$3,100

Requires: Serial port, serial-to-serial cable.

CIRCLE 443 ON READER SERVICE CARD

Digital Controls Video soon will be coming out with an interface it calls the Red Max. It allows up to two videodisk machines, or a combination of an industrial videotape player and a videodisk player to be controlled at once. It can accommodate any player, from the Magnavox minijack plug to the Sony serial port, and makes lesser models function more like top-of-the-line industrial players.

The programming language is simple: one word commands control every function the player can perform. When hooked up to a Sony Profeel or KX Series monitor, Red Max can switch between RGB and video outputs displayed on the monitor and even support the overlay of computer graphics on the video image. This is a serious industrial-level interface for an affordable price of \$855.

On Line Computer Systems will be offering an interface for the PC and the Pioneer 8210, as well as other industrial players, that also will accommodate touch screens, light pens, or joy sticks. On Line developed Pilot Plus authoring language as a simple, yet powerful, tool for programming videodisk interactivity without dealing in programming terms. It is an example of the right kind of software necessary to make the interface hardware manageable. It works on many different computers and videodisk players, and can be purchased separately for \$150.

Allen Communications is one of the more established names in this very young field of interactive video. They're coming out with a self-contained interface for the PR8210 and Sony players that does just about anything you'd want. It can switch the TV screen display between the videodisk and computer display outputs via software, integrate audio tape recorders to feed sound over still frames, and control several videodisk and videotape players at once. But all this capability does not come without its price. The Allen Communication Universal Video Controller sells for \$1,200.

Because the Sony player already has a serial port, all that is needed for interaction with the PC is a standard serial-to-serial (null modem) cable obtainable at computer stores. Of course, you need software to drive the interface, and Sony has adopted Pilot Plus, enabling the user to put together a program sequence controlling the videodisk player without ever using one BASIC command.

The Philips player also has a direct-connect serial port that needs no interfacing. Because of its extremely high compatibility with a computer, it is being used in upcoming arcade machines. Philips has developed a user-friendly program for the PC in conjunction with their industrial player. The programming menu gives a constant readout of what player options are being employed, and asks the user questions about what he or she would like the player to do next. Philips has yet to decide how it will make its software available to consumers.

RCA's CED interactive videodisk also can be interfaced to the PC by way of a special interface card that plugs into the remote jack on the back of the player. The interface consists of two small resistors, which leads one to wonder why RCA couldn't have put them into the player so that no interface would be needed at all. RCA also has developed a programming language for the unit, written in FORTH. Both the interface and the software are still at the development level. There are no definite plans for making either available for consumers yet.

SOFTWARE

*is the important factor
in interactivity.*

Interactive Research Corporation has a novel approach to videodisk interfacing. It contends that you don't really need a separate interface at all. All you need do, they say, is modify IBM's standard serial port card with one small jumper cable, and you're set to interact. Alan Atkins, of Interactive Research, claims that software is the important factor in interactivity, and he's going to be introducing a new line of interactive floppy-disk programs and accompanying videodisks custom-made for PC use. He has just produced an interactive videodisk that teaches how to operate the IBM PC by learning at a workstation equipped with a PC, a laserdisk player, and his software. He plans to sell this workstation to retail stores that carry the IBM PC and to industries for training purposes. The work station also has digital

voice interaction and compressed audio-over-still-frame capabilities. It is a prototype of what we can expect for offices and home entertainment centers of the near future.

The Future

Until recently, computer and television technologies were on two separate tracks. Now they are coming together to

THE
trade-off for being on the leading edge of an exciting new technology is having to put up with crude methods of operation, incompatible components, and clumsy documentation.

form a new communications medium. As of yet, the full potential of this fusion has not been realized.

Because the area is young and uncharted, there isn't much standardization in the equipment, or in the way videodisk players interact with the PC. For anyone trying to work in this area, the trade-off for being on the leading edge of an exciting new technology is having to put up with crude methods of operation, incompatible components, and clumsy documentation. All these symptoms of an emerging technology will certainly clear up as the field becomes more established and pervasive.

The next generation of consumer players is expected to have serial port provisions for integration with personal computers, so if you can wait a year or so, the equipment will improve. In the meantime, it's an area wide open for experimentation. Granted, the interactive videodisk is still in its infancy, but what a bright future this child has in store for it. /PC

Ariel Schwartz heads his own independent production firm, Ariel Productions, which specializes in interactive video.

Videodisk Hardware/Software Support Items

The following manufacturers supply support items for the laser or CED Videodisk player.

Interactive Hardware Manufacturers

Universal Video Controller Interface

Allen Communications
140 Lakeside Plaza II
5225 Wiley Post Rd.
Salt Lake City, UT 84116
(801) 537-7800

List Price: \$1,200

Requires: Serial port.

CIRCLE 652 ON READER SERVICE CARD

Red Max Interface

Digital Controls, Inc.
5555 Oakbrook Pkwy., #200
Norcross, GA 30093
(800) 441-3332

List Price: \$855

Requires: Serial port.

CIRCLE 651 ON READER SERVICE CARD

Serial Port Upgrade

Interactive Research Corp.
2655 Campus Dr., #235
San Mateo, CA 94403
(415) 572-1346

List Price: contact manufacturer

Requires: IBM serial port.

CIRCLE 650 ON READER SERVICE CARD

DiscoMaster 1000 Interface

New Media Graphics Corp.
145 Main St.
Cambridge, MA 02142
(617) 547-4344

List Price: \$395

Requires: Serial port.

CIRCLE 649 ON READER SERVICE CARD

Interface and Pilot Plus Software

On Line Computer Systems, Inc.
20010 Century Blvd., #101
Germantown, MD 20874
(301) 428-3700

List Price: \$350 (est.); software separately, \$150

Requires: Serial port, 128K.

CIRCLE 648 ON READER SERVICE CARD

Laserdisks Sources

Optical Programming Assoc.
445 Park Ave.
New York, NY 10022
(213) 508-2745

List Price: \$19.95 to \$29.95

Requires: Laserdisk player.

CIRCLE 647 ON READER SERVICE CARD

Pioneer Video

200 West Grand Ave.
Montvale, NJ 07645
(201) 573-1122

List Price: \$19.95 to \$39.98

Requires: Laserdisk player.

CIRCLE 646 ON READER SERVICE CARD

CED Disks Source

RCA Videodisc Division
1133 Ave. of the Americas
New York, NY 10036
(212) 930-4700

List Price: \$19.95 to \$39.95

Requires: CED player.

CIRCLE 645 ON READER SERVICE CARD

Monitors for Video/RGB System

KX Series monitors

Sony Consumer Products Co.
Sony Dr.
Park Ridge, NJ 07656
(201) 930-1000

List Price: \$850-\$1,500

Requires: Color/Graphics card, Sony PC-701 interface cable (made just for the PC).

CIRCLE 644 ON READER SERVICE CARD

Newsletter

Videodisc Update

Meckler Publishing
520 Riverside Ave.
Westport, CT 06880
(203) 228-6967

CIRCLE 643 ON READER SERVICE CARD

INVESTING IN A BUSINESS SYSTEM SHOULD SOLVE PROBLEMS. NOT CREATE THEM.

In today's business climate, the need for a good business system has become more apparent than ever before. Choosing reliable business systems in a flooded market is no easy task and can confuse even the most informed businessman.

AMI has taken the mystery and risk out of buying a business system. We understand that serious prospective clients evaluate a business system on the basis of three criteria:

- Ease of Operation
- Comprehensiveness
- Reliability

AMI has surpassed these requirements with a difference that makes us stand out among the competition. That difference is problem solving. Our programs have been developed slowly and thoroughly, originating from systems written for larger business computers. These systems have been proven on six generations of IBM computers, the latest being the PC and PC-XT.

Our problem solving approach to business has taken us above and beyond the usual ledgers and spreadsheets. What other software package can offer a 17 digit General Ledger code, broken down into four levels; accounts, sub-accounts, job/department



ing, and a comprehensive billing package, and features tracking from initial set-up to completion.

AMI does not stop there. Our Restaurant Accounting package features a payroll portion that takes into account Tip Reporting, employees working in multiple departments, FUTA, SUTA, W-2's, 941-A's and QTD/YTD earnings reports. The Restaurant inventory features a multitude of reports including a daily requisitions register and an Average Cost Variance Report.

Other packages offered are: a completely inte-

grated Construction Accounting Package featuring automatic overhead calculation in the reports, Job Cost Detail, Job Cost Summary, Percentage Completion and Supervisor Responsibility reports; a CPA Accounting System, a Manufacturing System and a Professional Office Management System.

No other packages will give you such a flexible array of options with time tested AMI reliability. Invest in AMI business systems and join the growing numbers of large and small businesses now using our software.

For more information contact:
Automation Management, Inc.
5718 Westheimer, Suite 410
Houston, Texas 77057
or call Toll free 1-800-231-0634
in Texas call (713) 781-5941



PC Arcade presents *Big Top*, a game of circus antics; *Buzzard Bait*, for those who like dead baby jokes; and *Computer Facts in Five*, a weak video version of a popular board game.

Under The Big Top

Big Top

Funtastic, Inc.
5-12 Wilde Ave.
Drexel Hill, PA 19026
(215) 622-5716

List price: \$39.95

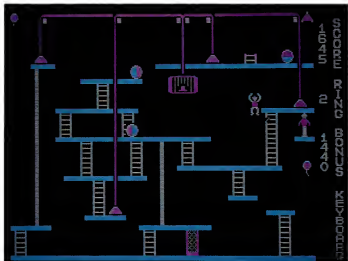
Requires: 64K RAM, one disk drive, color/graphics adapter, joystick and game control adapter optional.

CIRCLE 800 ON READER SERVICE CARD

Ladies and gentlemen and computer users of all ages: Presenting *Big Top*, starring Amazing Wendell the acrobat, the clumsy hatless ringmaster, and the avenging murderous clowns. Yes, folks, for only \$5,000, plus \$39.95, give or take a few quarters, you can bring forth P.T. Barnum on your very own PC.

Well, as old P.T. once said, "There's a sucker born every minute." This game suckered in a good portion of the PC Magazine staff late one Friday afternoon—it provided so much distraction that the executive editor couldn't get to the keyboard to resume play until Monday. *Big Top* is a lovely piece of work, a beautifully designed, barrel-of-monkeys worth of fun.

Like many arcade-type games, the story line on this product is a bit strained. "It was just another day at the circus for Wendell, an apprentice acrobat, until the ringmaster lost his hats and chaos broke loose in every ring! To save the circus, you must retrieve all of the ringmaster's red hats in



A claimant to the Greatest Show on your PC, *Big Top* presents the uneasy escapades of Wendell the Acrobat, here seen dodging the circus clowns.

each ring. But beware: The clowns are out of control! They'll be chasing you, throwing knives, rolling beach balls, and even firing cannons at you! You'll need every bit of acrobatic agility you can muster as you run, climb, slide, jump, fall, duck, and swing your way through the many rings of the BIG TOP!"

As I said, no threat to the fiction best-

seller list. Why are the clowns so mad at Wendell? Why did the ringmaster lose his hats? What does it matter? *Big Top* shines in its performance—not in its raison d'être. It's more fun to play than to describe.

Big Top requires 64K RAM and the color/graphics adapter. You can play the game using the keyboard (you can assign

your own keys if you like), but I found it much easier and more enjoyable to use a joystick. Written in machine language, the program's response time was quite good. The disk was copy-protected. Big Top was tested on an RGB color monitor; display should be good on a color television connected to an RF modulator, as well.

There are nine levels of play; actually, all that varies is the speed of the characters and objects. I found Level 1 painfully slow, even for a beginner; Level 9 was quite fast, but playable. The consensus of the peanut gallery was that the middle levels were the best for neophytes at the circus. The sound can be toggled on or off; the user can select either of the two IBM medium-resolution color palettes for play, and the game can be suspended with the Esc key. The program appeared to be properly bulletproofed, although I was able to bang it up during the keyboard selection process by calling for a screen print.

Anyway, you're booked right from the beginning as a cute little opening billboard sets the scene. We see Wendell walking across the bottom of the screen. He comes to a ladder and scurries up to the top; there he grabs hold of the bottom of a billboard and then yanks down a screen full of opening credits. The initial "ring" itself asks Wendell to climb ladders, jump from platform to platform, slide down firemen's poles, and glide from trapeze to trapeze—all in pursuit of the hats—while these angry clowns are scurrying after him. It was relatively easy to avoid the clowns; it was much harder to time the jumps. When Wendell misses the mark or lands too hard, he goes splat and one of three lives is lost. Colliding with a clown costs a life, as does running out the allotted time for each ring.

If you manage to collect all of the bats, a new ladder grows in the upper right-hand corner of the screen. Get Wendell over there and climb, and he climbs into the next screen—another nice piece of programming. The second ring involves collecting the Strong Man's weights and avoiding bouncing beach balls and tossed knives. The third ring includes a tumbler's seesaw and a tubful of water.

All that I can testify to are these three rings; according to Funtastic, the first trio repeats a few times at higher speed and with more clowns and balls and then several other unspecified rings pop up. They don't—and won't—say how many other

challenges are included. I'm not sure how much I like that philosophy—I like surprises every bit as much as the next guy, but I also like to have some idea of what I'm getting into when I buy my ticket. A few other nits: The hats and weights and other prizes always appear in the same place in each game, and Wendell always starts in the same position. Although this may help you progress to upper levels by establishing a pattern and a rhythm, I yearned for a bit of variety.

The game is obviously derived from a few of the most popular arcade and home computer bits: The ladders reminded me of Apple Panic, the jumping Wendell of the jumping Mario in Donkey Kong, and the sound effects of the old standby, Pac-Man. That's not a bad lineage. And further, Big Top is written by Michael Abrash, author of Cosmic Crusader and Space Strike, and coauthor of Snock Attack II—all three games are standouts in design and execution. Encore!

On the PC magazine rating scale, from a low of one to a high of six, Big Top rates:

FUN:	4.5
CHALLENGE:	4.5
GRAPHICS/SOUND:	5.0
TOTAL SCORE:	14.0

Buzzard Boit

Sirius Software, Inc.
10364 Rockingham Dr.
Sacramento, CA 95827
(916) 366-1195

List Price: \$34.95

Requires: 64K RAM, one disk drive, color/graphics adapter, joystick and game adapter optional.

CIRCLE 799 ON READER SERVICE CARD

This is a game for people who like dead baby jokes. We don't. Buzzard Boit is



Buzzard Boit enters the dark side of shoot-em-ups.

almost too smarmy for the lowest Notional Lampoon parody.

Yes, folks, some people are convinced the IBM PC was invented for the likes of this: Your job is to destroy the buzzards who are snatching helpless babies off the ground to feed to their young.

Some of the babies don't make it to the nests at the top of the screen and fall back to ground. You can save them by spearing them with your ship before they go splat. You must also avoid "Pushy Penguins" that fly across the screen trying to bounce

BUZZARD BAIT *is almost too smarmy for the lowest National Lampoon parody.*

you off course. (The fact that penguins are flightless birds doesn't seem to faze the designer of this "game." Never let facts get in the way.)

In case you think there's a bit of an overreaction here, consider the cover of the Sirius Software catalog: Among the cartoon characters is a buzzard with a baby in its claws. "I'm hungry," says the bird. "I'm dead!" says the baby.

There are a few more elements to this game—shooting baby birds, shooting flying birds, collecting bonus ships by assembling floating parts—but why belabor the obscene?

One other thing: The display on an RGB monitor is in glorious black and white. This "game" is a translation of an Apple II product, and it seems that time and expense was spared. Then again, it could have been worse. Imagine the color scheme its designers might have chosen. I suspect the game will display some colors on a composite color television.

The playing details, if you must know, include a joystick for left, right, or jump off your mother ship; buttons are used to fire and to jump. The game also can be played from the keyboard, and key assignments are reassignable. The program is not copy-protected. Sound can be toggled on or off, and the game can be paused in mid-carnage.

On PC's rating system of one to six,

Buzzard Boit wallows as follows:

FUN:	2.0
CHALLENGE:	2.5
GRAPHICS/SOUND:	2.5
TOTAL SCORE:	7.0

Computer Focets in Five
Microcomputer Games
Avalon Hill Game Co.
4517 Harford Rd.
Baltimore, MD 21214
(301) 254-5300

List Price: \$26.00

Requires: 64K RAM, one disk drive, monochrome adapter or color/graphics adapter.

CIRCLE 796 ON READER SERVICE CARD

I wonder what our compatriots over at *Cor and Driver* magazine would think if Mercedes announced it would release a line of gut-bucket Chevettes?

This is the second Avalon Hill retreat to show up in the Arcade in as many months, and once again it is disappointing to find such a weak translation of one of that company's excellent board games. Last month we spoke of a bear-market Computer Stocks and Bonds; this month, we look at Computer Focets in Five, which is not nearly so awful, but as of yet has not attained the quality level of its paper-bound equivalents.

Now, understand, I am a "Focets in Five" fan—in the board-game version. I spent many a night in college struggling to think of a Burmese river beginning with the letter I (the Irrawaddy) or a National

scoring method that comes up with one score to rate a player's "special" knowledge or depth of information for specific classes; a "general" score to compare the breadth of a player's knowledge across many classes; and a "total" score to be used in the competitive mode.

In each round, five classes end categories of subject matter are selected from more than 1,000 choices in the computer's database. The selections can be made on a random basis, or by player A for the bedevilment of player B. The computer then randomly selects five letters (including the possibility of a wild-card letter represented by an asterisk), which takes pressure off the players. For each subject and letter, the player tries to respond with an answer that fits the subject.

One strong point of the computerized version is that it offers a variety of games: normal play, in which the player can move around to answer any question in any order; sequential play, in which the machine moves from top left to bottom right to each unanswered position; random play, also governed by the computer; timed sequential play, with 12 seconds per answer; and timed random play.

There are solitaire versions, doubles versions, and "party" modes. (In the party mode, there is no entry of words from the keyboard; players on the various teams must keep track of their guesses on paper.)

The disk includes both monochrome display adapter and color/graphics adapter versions. The monochrome version is competent, with a small, but readable, display. Time is tracked with a digital clock readout on the bottom of the screen. On the color version, a nice graphic of an hourglass with sand spilling from top to bottom keeps track of the time—a nice reference to the real hourglass provided with the board version of Focets in Five. But for some reason, the designers at Avalon Hill chose white letters against a purple background on an RGB monitor as the prime color display. This is, I suppose, an improvement over the white against yellow I found with Computer Stocks and Bonds, but still a rather user-eye-unfriendly mode.

A few other detractions: The IBM PC version we received included a two-page instruction sheet on how to convert a TRS-80 Model I diskette to run on a TRS-80 Model III computer. While I found the rig-

THE GAME can be paused in mid-carnage.

League batting champion whose name begins with F (Carl Furillo, Brooklyn Dodgers, 1953, '344).

The game itself is "trivia" with rules. It is similar to a game called "Botticelli" my family used to play on long car trips to Cape Cod in the summer. The point is to find a person or a thing to match the required alphabet letter, class, and category. There is a 5-minute time period for each player and an appropriately arcane

SOFTWARE:	
• KNOWLEDGEMAN (MDBS)	CALL
• LOTUS 1-2-3	CALL
• VOLKSWRITER	\$139.00
• LIFEWIRE (Software)	
• LIFEWIRE II	\$239.00
• DOS Version (JUS)	
• MULTI TOOL WORD	\$349.00
• WITH MOUSE (Microsoft)	
• THE FINAL WORD	\$199.00
• (Work of the Unicorn)	
• PERFECT WRITER/PELLER	\$299.00
• (Perfect Software)	
• MULTI-MATE (Soft Word)	\$349.00
• CHARTMASTER	\$299.00
• (Decision Resources)	
• PROOFREADER	\$ 49.00
• (Aspen Software)	
• GRAMMATIK	\$ 99.00
• (Aspen Software)	
• DATA BASE II (Alpha)	CALL
• HOME ACCOUNTANT PLUS	\$110.00
• (Continental Software)	
• LETTER BANKCOURIER I	\$ 92.00
• (Nyrdham Group)	
• COMPUTER SAT (IBJ)	\$ 69.00
• FRIENDLYWARE, Arcade	CALL
• (Friendly Soft, Inc.)	
• PETER NORTON UTILITIES	\$ 92.00
• FLIGHT SIMULATOR	\$ 44.99
• (Decision Resources)	
• GAMES:	
• SUSPENDED (Infocom)	\$ 39.95
• MILLIONAIRE (Blue Chip)	\$ 92.00
• ASYLUM (Med Systems)	\$ 34.95
• EXECUTIVE SUITE (Armonk)	\$ 32.95
• FROGGER (Sierra on Line)	\$ 29.00
• PINBALL (Sublogic)	\$ 34.00
• PC MAN (Orion)	\$ 29.95
• WORD CHALLENGE	\$ 34.95
• (Proximity)	
• THE INSTRUCTOR	\$ 39.95
• (Individual)	
• PROFESSOR DOS (Individual)	\$ 49.95
• PROKEY (Rose Soft)	CALL
• PC TUTOR (Comprehensive)	\$ 92.00
• PFS FILE, PFS WRITE	\$ 99.00
• (Software Publishing)	
• PFS REPORT	\$ 99.00
• (Software Publishing)	
• DESK ORGANIZER	\$209.00
• (Conceptual Instruments)	
• COPY II PC	\$ 34.00
• (Central Point Software)	
• HAYES SMARTCOM II	\$ 99.00
• (Hayes)	
• MULTIPLAN	\$199.00
• (Microsoft)	
• MEMORY SHIFT	\$ 92.00
• (N. American Business)	
• PC PFP (Best)	\$ 75.00
• PC PAB (Best)	\$299.00
• FANCY FONT (Softare)	\$155.00
• FRIDAY (Ashon-Tate)	\$229.00

STUFF:

• ELEPHANT DISKETTES	
Package of 10 - 5.25"	\$ 29.00
Package of 10 - 5.25"	\$ 35.00
Package of 10 - 5.25"	\$ 35.00
• COVERS FOR THE IBM PC	\$ 11.99

FREE with order over \$75.00
plastic Library Case —
holds 10 diskettes

NEW
COMPUTER SAT
(Marcourt, Bruce Javorovich, Inc.)
Improve SAT Scores
\$68.00

CALL OR WRITE FOR MORE INFORMATION.
1ST CLASS SHIPPING INCLUDED.
NO EXTRA CHARGES



P.O. Box 795065
Dallas, Texas 75379
(214) 458-1718



marole rether quaint. I worried about confusion to new users of that other machine, the IBM PC. You had to hunt all the way to page 9 of the instruction manual (printed in light brown on white; does Avalon Hill have stock in the Bayer Aspirin company?) to find the instructions on booting the game on a PC. The instructions ask that you load a DOS system disk in A, enter BASICA, remove the disk, replace it with the Computer Facts in Five disk, and type RUN"FACTS". Apparently the designers never considered asking the user to copy over BASICA onto the game disk and, further, have not provided for a simple AUTOEXEC batch file. Here, for free, try this:

COPY CON: AUTOEXEC.BAT
BASICA FACTS
"Z"

And still more confusion. The IBM instructions include a note that reads as follows: "If a communications adapter is installed in your IBM type BASICA /C/O" Why? Well, according to the fine print in

the IBM BASIC manual, invoking BASIC in that manner disables RS-232C support, in which case no buffer space will be reserved for communications. How much space does Computer Facts in Five gain by asking for this unusual extra step? A total

YOUR JOB
is to destroy the
buzzards who are
snatching helpless
babies off the ground to
feed to their young.

of 972 whole bytes! It can't be worth the effort, but the worst thing about the instruction book is that it uses a capital letter "O" in the command—that simply won't work. What the PC is looking for is e

zero. Avalon Hill: See page 2-6b, BASIC 2.0 manual. No charge.

There are more nits: Why does the program allow you to enter a word beginning with the wrong first letter? If ever there was a place for a beeping error buzzer, this is one. Why isn't there a line of coding that asks the user whether he wants e color or monochrome version of the game? The only way I could switch back and forth on my fully equipped PC-XT was from outside of the program using e DOS command.

Enough, enough: Avalon Hill, please don't fritter away your reputation. Do it right—I really want to say something nice about your products.

On the PC rating scale of one to six, I am subtracting points in the Graphics/ Sound category as e penalty for design flaws:

FUN:	4
CHALLENGE:	6
GRAPHICS/SOUND:	0
TOTAL SCORE:	10
	/PC

EXTEND THE CAPABILITY OF YOUR PC

**RTCS ADVANCED OPERATING SYSTEMS AND SOFTWARE DEVELOPMENT
TOOLS CAN TAKE YOUR PC TO THE LIMITS OF YOUR IMAGINATION**

RTCS/UDF - UNIVERSAL DEVELOPMENT INTERFACE

- Runs Intel Series III software on a PC, XT or any MS-DOS computer.
- PC / Series III file transfer software included
- 100% software compatible with Series III.
- PCSBC - Upload, download & debug target system (Option).
- UDEBUG - Onboard debugging tool (Option)
- Over 800 licensed RTCS/UDF's in use
- PRICE \$500

PC/IRMX - REAL-TIME MULTIUSER MULTITASKING OPERATING SYSTEM FOR IBM PC

- More versatile than Intel's System 86/330.
- Intel Utilities, Edit, Link, Locate, Librarian & ASM included
- Intel Pascal 86, Fortran 86, PL/M 86 and C 86 Languages optional
- Ethernet, GPIB and Hard Disk options.
- Available for COMPAQ, TI Professional and DEC Rainbow
- PRICE \$2,250

FORCON - BRING DOWN MAIN FRAME FORTRAN PROGRAMS TO RUN ON THE PC

- Pascal, PL/M, Fortran 77/86 and C compatible compilers.
- Superior object code optimization and in-line 8087 code
- Support large arrays (over 64K)
- Overlay loading
- Object modules run on IBM PC and XT
- Special large program utilities option
- Available for COMPAQ, TI Professional and DEC Rainbow
- PRICE \$4,850

SOFT SCOPE - HIGH LEVEL SOFTWARE DEBUGGER

- Source code interface
- High level Trace, Single Step and Breakpoints
- Access to Symbols and Line Numbers
- Machine disassembly and Floating Point support
- Goes beyond Intel's Pscope
- PRICE \$395

All RTCS Software products support the 8087 Numeric Data Processor. Soft Scope is a trademark of Concurrent Sciences, Inc. MS-DOS is a trademark of Microsoft Corp. IRMX is a trademark of Intel Corporation.

RTCS

Distributed in Japan by SYSCON CORP. Tokyo

**REAL-TIME COMPUTER SCIENCE CORP. ADVANCED DEVELOPMENT TOOLS
P.O. BOX 3000-886, CAMARILLO, CALIFORNIA 93011 • PHONE NO. (805) 482-0333 • TELEX 467897**

CIRCLE 443 ON READER SERVICE CARD

In the early PC days, the spreadsheet program VisiCalc was considered a reason to buy a personal computer. This popular program is still around and has inspired many books, six of which are reviewed here.

VisiCalc Books

The VisiCalc spreadsheet program was one of the most significant influences on the personal computer industry's history. Strong words? Maybe, but they probably are justified. VisiCalc was one of the original software packages offered by IBM at the time it announced the PC. Although I don't know the numbers, I would assume that a high percentage of the early PC packages included VisiCalc. As the talk of personal computers increased in the media, the VisiCalc program was often mentioned, and it became one of the reasons to buy a personal computer. The VisiCalc program probably contributed to more hardware sales than any other program around during that period.

VisiCalc has been imitated by many other companies, with varying degrees of success. Its manufacturer, VisiCorp, has kept pace itself by releasing VisiCalc Advanced Version. The program that started it all is still going strong.

Unknowningly, VisiCorp has provided a livelihood for a bunch of folks across the country. In addition to the program imitators, there were several authors who perceived a need for a book about VisiCalc. Their perceptions were wise, and today a number of books on the program exist.

VisiCorp itself has even published one, in addition to its manual.

In general, these books fall into three categories. First are the tutorial books, which explain each VisiCalc command and give its use. Second are the model and template books, which give detailed lists of the instructions necessary to generate a VisiCalc template or skeleton spreadsheet for use with your own data. For an additional charge, these books often offer the templates on a diskette for those who don't want to key in all the necessary information themselves. The third category is comprised of books that combine these two approaches. The authors of these believe that users will best learn VisiCalc by both keying in a model, and by studying the commands.

The tutorial books have a limited appeal, since once the user becomes familiar with the various commands and understands the operations of the program, the book has little use. For this reason, strictly tutorial books are not very common. The other two types are popular and can be found on the shelves of most large bookstores. The combination-type books are the most common, so I'll begin with them.



The VisiCalc Program Made Easy
David M. Castlewitz
(Osborne/McGraw-Hill, Berkeley, CA, 1983)
195 pages; softcover; \$12.95

CIRCLE 797 ON READER SERVICE CARD

Since the versions of VisiCalc available for the different brands of personal computers are quite similar, most authors attempt to expand the market for their books by writing about more than one version. Although this approach usually does increase sales, it entails some sacrifice. In *The VisiCalc Program Made Easy*, the author David M. Castlewitz looks at VisiCalc as it applies to the IBM PC, Apple II, Apple II Plus, Apple III, and three different Commodore models. I was concerned primarily with the PC version, and found the explanations of various commands difficult to follow. Sometimes the computer-specific instructions are enclosed in

a gray box, sometimes they are not, and sometimes they are only partly boxed. Very confusing!

Each chapter of this book is divided into several lessons and each lesson covers two or three different VisiCalc commands. I found this format conducive to learning the material. Each lesson covers the commands thoroughly, using examples and showing results: so few commands are covered that each lesson is easy to grasp.

Approximately 60 percent of the book covers advanced functions of VisiCalc. Examples are given to explain how these functions are used; some of them are rather interesting and useful. One template, for example, determines periodic payments for various interest rates and terms of repayment.

One chapter, which includes six lessons, covers model building techniques to assist you in building models of your own. This chapter also includes a detailed explanation of DIF files used to transfer VisiCalc information to other programs. I

found the explanation very thorough.

If you are willing to spend the time to dig your way through the first few lessons and figure out which instructions apply to your computer, The VisiCalc Program Mode Easy will be a helpful guide to the more advanced functions of the VisiCalc program. But if computers and VisiCalc are brand new to you, you will probably find some areas of the book confusing.

The VisiCalc Applications Book

Jack Grushcow

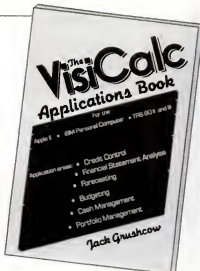
(Reston Publishing, Reston, VA, 1984)

276 pages; softcover; \$16.95

Models available on diskette for \$29.95

CIRCLE 796 ON READER SERVICE CARD


In contrast to The VisiCalc Program Mode Easy, The VisiCalc Applications Book handles the problem of giving computer-specific instructions. It covers the TRS-80 Models II and III, the Apple II,



Apple IIe, and the IBM PC and XT. Photos of each keyboard are shown and a description of their differences is given in the chapter, "The Preliminaries." The book's author, Jack Grushcow, establishes some

When you're ready to play hardball...

QCS HardDrive™ for the IBM PC



...a high performance, 5 1/4" Winchester hard disk subsystem of 10 to 84 Mb. The external design gives you the convenience of two floppy drives and eliminates the heat and power problems associated with internal drives. A 5 Mb removable cartridge option is also available. Prices start at just \$2499.00

See us at
COMDEX/Fall '83
November 28-December 2, 1983
Las Vegas Convention Center
Las Vegas, Nevada
BOOTH #3255

QCS inc

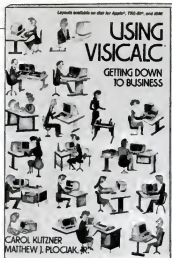
Quality Computer Services, 3 Quces Drive, Metuchen, NJ 08840, (201) 548-2135, Toll free: (800) 631-5944

CIRCLE 523 ON READER SERVICE CARD

standard symbols that apply to all computers, and he uses them throughout the book.

The VisiCalc Applications Book was written for everyone from complete novices to experienced VisiCalc users. A section titled, "Why and How to Use this Book" tells you which chapters to read, depending on your experience level. The beginning chapters include very basic instruction and go into great detail. The later chapters describe applications and models, each chapter covering a separate application. The book doesn't discuss most of the program's advanced functions at all; only the @Sum and @Error functions are mentioned in the index. The book teaches you only the minimum commands needed to understand the applications and models presented.

The major problem with this book is that typographical errors appear frequently. They are particularly troublesome in the keystroke-by-keystroke instructions for keying in the Cash Flow model. After trying to figure out the correct instructions



for quite a while, I gave up. It is obvious that the screen pictures shown in the book were not obtained from the same model as the one listed. If the printed directions are followed as given, the model doesn't operate correctly.

The concept behind The VisiCalc Ap-

plications Book is sound and it is generally well written. But the book has two considerable problems: the incorrect model listings, and the minimum number of VisiCalc commands that it covers.

Using VisiCalc—Getting Down to Business

Carol Klitzner and Matthew J. Plociak, Jr.
(John Wiley and Sons, Somerset, NJ, 1983)

277 pages; softcover; \$16.95

Models available on diskette for \$39.95

CIRCLE 795 ON READER SERVICE CARD

Using VisiCalc gives thorough coverage of all the VisiCalc commands and functions and provides several business applications models, as well. It is written for the Apple II, the IBM PC, and the TRS-80 Model III. Computer-specific procedures are enclosed in boxes and clearly labeled. The procedures for the PC are accurate except for the one describing

THINK BIG!

80 MEGABYTES FOR THE IBM-PC

DISC TECH ONE, INC. has recently announced **THE FIRST 80 MEGABYTE DISC DRIVE** compatible with the IBM PERSONAL COMPUTER. This subsystem is software and plug-compatible, thus there are no complicated adjustments and nothing else to purchase. This subsystem boasts Winchester technology, reliability, and performance . . . the perfect companion to the IBM-PC.

NETWORKING. DISC TECH ONE can provide a patented networking known as X-NET for your IBM-PC. Up to 255 nodes can be attached with unlimited cables. This shared disk networking allows common access to all programs, faster access time, and greater convenience.

COST. The price for the 80 Megabyte subsystem includes the disk drive, controller, SMD interface board, adapter card, power supplies, rack mount rails, and cables. The unit 1 price for DTO's subsystem is \$5,500. Quantity pricing is available.



DISC TECH ONE, INC.

849 Ward Drive / Santa Barbara, CA 93111 / (805) 964-3535 / TWX 910-334-4904

CIRCLE 206 ON READER SERVICE CARD

how to print the formulas behind the worksheet. It tells you to enter "P" instead of "LPT1:", which is what really works. Overall, though, the different models and brands are handled very well and should cause you no trouble.

The book is divided into four sections. The introduction gives a brief description

detail. Section three discusses and lists several management applications or models. The details of the models shown in this section can be found either in the appendix or on the optional diskette, which may be purchased for use with the book. Section four describes VisiCalc Advanced Version by listing its major changes from VisiCalc, including the operation of the new commands.

I found that the "How to Use VisiCalc" section of the book was an excellent tutorial on the use of the program. All the commands were covered clearly and sufficient details were given. The text is accompanied by pictures of VisiCalc screens, which help teach the topic being covered. The end of each chapter has review questions and a practice exercise, to reinforce what was learned, and a summary chart showing all the commands covered to that point.

The management applications section covers such applications as forecasting, cash flow, break-even analysis, and more. My biggest complaint with the entire book

is that the examples shown in this section are copies of a poor dot-matrix printout and are very difficult to read. Aside from this, though, the section is excellent. Each of the applications is well explained and the model listings in the appendix are clear and easy to read.

Overall, *Using VisiCalc—Getting Down to Business* is an excellent value and has no major faults.

OVERALL,
*Using VisiCalc—
Getting Down to
Business is an excellent
value and has no major
faults.*

of the history of the program and its uses. Section two, "How to Use VisiCalc," covers all the commands and functions in

VisiCalc for the IBM Personal Computer
Edouard J. Desautels
(Wm. C. Brown, Publishers, Dubuque, IA, 1983)
155 pages; softcover, spiral bound;
\$16.95
Models available on diskette for
\$39.95

CIRCLE 794 ON READER SERVICE CARD

VisiCalc for the IBM Personal Computer was written exclusively for the PC, and in some ways, the lack of the need for computer-specific instructions makes the

IBM PC-8087 SUPPORT FROM MICROWARE

87FORTRAN/RTOS™ is a full ANSI-77 subset with 8087 extensions. It generates in line 8087 code allowing use of all 8087 data types, including 32, 64 and 80 bit reals and 64 bit integers. The complete subset I/O is supported including Internal and External Files and List Directed I/O. Extensions include recursive subroutines, interrupt handlers and the generation of software interrupts. 87FORTRAN/RTOS uses the Intel large memory model, allowing data/code structures which utilize the full megabyte. The compiler provides direct access to 8088 ports and supports logical operations on 6 and 16 bit operands normally treated in assembly language. 87FORTRAN/RTOS is ideal for applications which are number intensive or control hardware. 95% of all "main frame" size programs compile and run without extensive editing. The price includes support for one year and RTOS. **\$1350**

RTOS™ — Real Time Operating System

RTOS is a MicroWare configured version of iRMK-86, Intel's legendary real time operating system. This DOS is entirely re-written and provides many features found only on mainframes. It includes the Intel Assembler, ASM-86, which supports the 8086, 8087, 8088 and 80186. All modules produced by the compilers or ASM-86 are combined, loaded and managed with the Utilities LINK-86, LOC-86 and LIB-86. These products make it possible to load modules anywhere in RAM, and resolve external references between runtime modules. Overlays with a single root job are supported by the linker. Binding of modules is accomplished at link or load time. RTOS/ASM-86/LINK-86/LOC-86/LIB-86 **\$600**

iRMK-86, LINK-86, ASM-86, LOC-86 and LIB-86 are trademarks of Intel Corp. IBM PC is a trademark of IBM Corp.

87PASCAL/RTOS™ is the most powerful compiler available to PC users at this time. It is an ISO-Standard Pascal with 8087-8088 exceptions. These make it possible to use all the 8087 data types directly, while generating modules in one of the three Intel Memory Models. Modules produced using different memory models can be interfaced and linked. This gives the user complete control of the memory model/speed trade off characteristic of iAPX CPUs. All exceptions to the ISO definition are clearly marked with a grey background in a manual which is a standard of the industry, and more readable than many tutorials. The compiler makes it possible to cause or handle interrupts. It also reads ports and performs all the tasks necessary to control iAPX-86 hardware. Use of 87PASCAL guarantees you upward compatibility with future Intel processors and languages. Includes RTOS. **\$1350**

MicroWare 8087 Products

8087-3 CHIP - in stock. **\$223**

87MACRO™ - our development package for the IBM Assembler includes a Preprocessor which translates 8087 opcodes, source for a library of code macros, and a COMPLETE function library with trigonometric, transcendental, encoder/decoder and conversions. **\$150**

87BASIC™ - includes patches for BASCOM.COM, BASCOM.LIB and BASRUXEXE and the MicroWare 8087 runtime routines. **\$150**

MATRIXPAK™ - assembly language matrix routines callable from any 8087 compatible IBM compiler. Allows user-specified very large matrices. Size is limited by available ram. **\$150**

87FASTPAK™ - includes one MicroWare runtime library, the 87/88 Guide, an 8087, and installation instructions. **\$375**

87/88GUIDE™ - an excellent tutorial on writing 8087 code and interfacing it with compilers. Full of code that runs. **\$30**
Microsoft Fortran 3.1 **289**
Microsoft Pascal 3.1 **289**
Microsoft Business Basic Compiler **495**
Microsoft C Compiler with Librarian **450**
Computer Innovations C/C86 **345**
SuperSoft Fortran **75**
87BASIC **75**
Energraphics **235**
Anderson-Bell Abstar **345**
64K RAM Upgrade Kit **64**
Hayes Smartmodem 1200B **499**
Sensistar Modular Expansion Boards call
Epson FX-100 or C. Rich Printers call

MicroWare

P.O. Box 79
Kingston, MA
02364
(617) 746-7341

**You Can
Talk To Us!**

CIRCLE 335 ON READER SERVICE CARD

PC MAGAZINE 452 NOVEMBER 1983



from one command to another, without any logical reason for doing so. While all the commands seem to be discussed, most of the explanations are a little sketchy. The examples, which the author calls Case Studies, were trivial in comparison to the application models in some of the other books discussed here.

None of the applications were complex enough to require the use of the optional diskette, so you might wonder what it's for, especially at \$39.95. At the end of the book the author says: "The optional diskette may be helpful for those of you who can't spare the time to do any avoidable typing, or those of you who will do anything to avoid typing." But if you use the diskette, instead of typing in the information as you go through the book, you will miss out on the benefits the book offers.

VisiCalc for the IBM Personal Computer is spiral bound and lays open nicely on the table while you use it, but this is perhaps its biggest plus. It might be sufficient as a review book for those who already understand VisiCalc, but it wouldn't be

much help to a beginner.

It is obvious that each author of the combination-type book has his or her own idea of what constitutes a good approach

IF YOU USE THE diskette, instead of typing in the information as you go through the book, you will miss out on the benefits the book offers.

book a lot more readable than some of those reviewed here. However, readability is one of its few redeeming features.

I found the sequence of topics haphazard and disconnected. The author, Edouard J. Desautels, randomly jumps

to the teaching of VisiCalc. A book of this type should, as a bare minimum, cover all the VisiCalc commands and functions in a clear and concise manner and give accurate instructions. Of these four books,

Software at Affordable Prices!

IBM PC/XT Business Software

TRAINING



\$53 ea.

Amer. Training Int'l.
CP/M SuperCalc
MS-DOS Multiplan
dBase II VisiCalc
Wordstar
Training Programs
Include Disk & Handbook

ACCOUNTING

Home Acc'l Plus \$ 89
Accounting Plus
GL/AR/AP/Payroll \$349 ea.

GREAT PLAINS™

GL/AR/AP/Payroll \$349 ea.
Inventory (w/PO Sale) \$399

Micro-Tax \$159
Individual \$599
Professional \$599
Part/Corp \$599
State CALL
Aardvark
Pro Tax Plan \$249
Estate Tax Plan \$549

GRAPHICS

Charlman II \$299
Charl-Master \$269

DATA BASE

InfoStar \$259
Supersort II (CP/M 86) \$149
PFS File \$ 99
PFS Report \$ 89



Condor 20-III \$349

Quickcode \$180
d Graph \$180
d Util \$ 60

Ashton-Tate
dBASE II \$389

Bottom Line Strategist \$279
Fnday \$249
Financial Planner \$449

THE
HAPPY COMPUTER
460 N. WOODWARD AVENUE
BIRMINGHAM, MI 48011

VISA-MASTERCHARGE
TO ORDER CALL: (313) 642-1454
INFORMATION: (313) 644-8921

FOR FAST DELIVERY

Send cash/check or money order. Specify hardware manufacturer, operating system, disk size and format. Personal or company checks to telephone order to these events to clear. Outside continental U.S. add \$10 plus per parcel per air. Add \$3.50 postage and handling per each item. Ship label \$3.00 additional per item. Michigan residents add 4% sales tax. Mastercharge. Use add 3% and include expiration date. Prices subject to change without notice. All items subject to availability. *Mega-Trends.

SPREADSHEETS

MICROSOFT.

Multiplan \$179

VisiCalc \$158
SuperCalc 2 \$179

LOTUS \$349

Ferox
Micro DSS/F \$749
Micro DSS/A \$399
Consultant's Edge \$199
Graphpower \$259
Log on \$129



WORD PROCESSING

MicroPro

Wordstar \$249
Mailmerge \$139
Spellstar \$139
Star Index \$129

Wordstar Pro.
All the Above \$379

Bibliography \$ 89
Grammarik \$ 55
Elect Thesaurus \$109
Volkswriter \$109

Dysan

Box of 10
5 1/4" \$5.00 \$ 34
5 1/4" \$5.00 \$ 38

HARDWARE

STE

Super Rio Card
One Parallel Port
One Game Port \$529
Two Serial Ports
Clock/Calendar
Spooler/Emulator
256 K RAM

Using VisiCalc—Getting Down to Business by Klitzner and Plociak is, by far, the best of the lot. If you are looking for a book that will give clearer instructions for VisiCalc than you were able to get from the manual that came with your program, try this one.

The template and model books, which make no attempt to teach any of the VisiCalc commands, are also popular with VisiCalc users.

54 VisiCalc Models

Robert H. Flast
(Osborne/McGraw-Hill, Berkeley, CA,
1983)

277 pages; softcover; \$15.95

CIRCLE 793 ON READER SERVICE CARD

The models included in 54 VisiCalc Models tend to be short and, in most cases, uncomplicated. They are divided into three categories: Financial Applications (23), Statistical Applications (16), and Mathematical Applications (15).

The format of each model is standardized throughout the book. Each model starts with a description of the application, including any necessary equations. The description is followed by some sample problems, which help make clear the kinds of cases for which the application might be useful. The next two areas show a template without any of the blanks filled in, and the results of the sample problem. The final area is the template listing. The listings range from a page of short lines to several pages of complex formulas.

The financial applications include a variety of models, such as Effective Interest Rate on Investments, a Mortgage Amortization Table (which is limited to 91 payments), and a Tax Depreciation Schedule. Models are provided for calculating the mean, variance, standard deviation, linear, geometric, and exponential regression in statistical applications. Included in the mathematical applications is a model for finding the greatest common denominator of two numbers, one that calculates the area of a polygon, and one for angle/metric



conversion. The book offers a wide spectrum of models, but probably only a few will be pertinent to your needs.

All the models that I tried worked as specified, and I found no typographical errors in the listings. If you have a need for any of the models listed in the table of contents, 54 VisiCalc Models may be worthwhile for you.



Whether you are a new user or experienced and looking to round out your expertise you will be impressed with Personal Tutor™ Training Tapes. Each package includes three detailed instructional tapes that will allow you hands-on experience at your own pace. Our audio courses don't take control of your computer away from you, but gently guides you to master your system and the most popular software packages on the market. Now you will learn how to use the power of the system you have invested in.

A Personal Tutor™ Will Awaken the Sleeping Giant in Your IBM®PC

FEATURES

- 3 audio-cassette tapes [No computer hook-up necessary]
- Effective step-by-step instruction in non-computerese language
- Quick reference summary card
- Sturdy vinyl protective case
- Written by technical consultants in coordination with an educational specialist
- Diskette with examples

ORDERING

Add \$2.50 shipping each item
VISA/MC Accepted
Check (allow 2 weeks)
COD



Payable to
Personal Tutor™ Associates
A Division of ExecSystems
Corporation
P.O. Box 246
Clinton, MD 20735
(301) 856-2280

Specify system when ordering
Note: Open packages not returnable

PERSONAL TUTOR™ INSTRUCTIONAL TAPES

WORD PROCESSING:

Easy Writer II® 49.95

DATA BASE:

dBase II® *59.95
PFS®: File/Report 49.95
Easy File® 49.95
VisiFile® 49.95

SPREAD SHEET:

VisiCalc® 49.95
TK! Solver™ *49.95
SuperCalc® *49.95
MultiPlan® 49.95
1-2-3® 49.95
Easy Planner® 49.95

COMPUTER:

IBM® PC 49.95

LANGUAGE:

Pascal *49.95

GRAPHICS:

VisiTrend/Plot® *49.95

*NOTE: Products still under development to be released soon. Call or write for availability.

CIRCLE 233 ON READER SERVICE CARD

VisiCalc Advanced Version—Worksheets for Business

Van Wolverton

(VisiCorp, San Jose, CA, 1983)
238 pages; softcover; \$18.95

CIRCLE 792 ON READER SERVICE CARD

VisiCalc Advanced Version—Worksheet for Business was written by VisiCorp for users of its second VisiCalc product, named in the title. I include it here for two reasons. First, the models it contains can be converted to the original VisiCalc without too much difficulty. Second, it gives you a good idea of the features VisiCalc Advanced Version includes and shows how they relate to a business model.

The worksheets included in this book differ greatly from the ones in 54 VisiCalc Models. These worksheets are all business-oriented, quite complex, and rather lengthy. Van Wolverton, the author of the Advanced Version book, includes 12

worksheets operate. How to enter the worksheet is described on a keystroke-by-keystroke basis, but if you don't have VisiCalc Advanced Version, you must do some editing of this section as you go along. You should be very familiar with VisiCalc if you plan to convert many worksheets this

keying has left you with some problem.

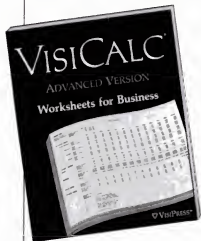
If you operate a business, this book contains some worksheets that will be useful to you and will probably convince you that you need VisiCalc Advanced Version (maybe that's why it is published by VisiCorp). The book is well written, clear, and concise—a good choice for any small business operation.

***THIS BOOK WILL
probably convince you
that you need VisiCalc
Advanced Version
(maybe that's why it is
published by VisiCorp).***

way. A listing of the contents of each cell of each worksheet is included in one of the appendixes, in case you find that your

More for Your Book-Buying Dollar

There are many books around that will enhance your knowledge of the VisiCalc program, and this article has touched on only a few of them. The key to buying the right book—the one that will best meet your needs—is to clearly identify your needs. If you can do that, maybe you'll get more for each of your book-buying dollars. With computer books, now priced in the \$10 to \$20 range, getting what you pay for is becoming much more important. Good browsing and happy buying! **/PC**



worksheets and devotes an entire chapter to each. The applications he discusses include Calculating Your Net Worth, Estimating the Cost of a Job, Forecasting Sales, and Developing a Business Income Statement.

Each chapter gives a detailed description of the worksheet and the application being discussed; instructions on how to use the worksheet after it is completed are included as well. A section also describes how the formulas for each particular

**Business Managers,
If you have to ask**

WHAT IF...?
when making business management decisions, you need Bottomline V.



A \$6,000 plus value retailing for \$295.00.
Ask your local dealer for a demo today.
Or call direct: Strategic Software Systems, Inc., 1300 Dove Street, Suite 200, Newport Beach, CA 92660, Telephone (714) 476-2842.

When you are preparing a budget, arranging for a loan, planning production, forecasting cash flow or other business management functions, you are going to have questions. Decisions involving a look at long-range information are difficult. Variables affect the entire financial picture. With Bottomline V, just enter your data and a logically integrated financial analysis will result.

Bottomline V is a ready-to-use management tool that allows you to integrate income statements, balance sheets, sources and uses of cash, or other pertinent data for instant analysis.

Bottomline V

For use with the following personal computer spreadsheets: MULTIPLAN™ on the IBM™ personal computer, SuperCalc™ on the Osborne™ VisiCalc™ on the Apple™ and other systems soon to be announced.

CIRCLE 585 ON READER SERVICE CARD

New On The Market

HARDWARE

UDS LP Modem Series

Five modems which draw their operating power directly from the telephone lines, eliminating the need for separate power supplies or power line transformers. The modems feature switch-selectable answer/originate and talk/data modes.

The five models in the series are: 103-O/A-LP, offering 0-330 baud operation conforming to the Bell 103/

113 protocol; 103J-LP, 300 baud plus an auto-answer capability; 202-LP, operating at 1200 baud using the Bell 202 protocol; 202S-LP, 1200 baud with auto-answer; and the 212-LP, providing higher speed operation using the Bell 212 protocol. (List Price: 103-O/A-LP \$145; 103J-LP \$195; 202-LP \$195; 202S-LP \$245; 212-LP \$445) Universal Data Systems 5000 Bradford Dr. Huntsville, AL 35805 (205) 837-8100 TWX: 810-726-2100

CIRCLE 799 ON READER SERVICE CARD



Streaming Tape Drive, Davong Systems

Streaming Tape Drive

A stand-alone, streaming tape drive for use as a backup storage device for Winchester or floppy disk drives. An adapter for tape backup plugs directly into the user's system. The unit copies data onto a 1/4-inch tape cartridge with formatted capacity of 18 megabytes.

The device uses NRZI bit serial, four track serpentine recording, at linear speeds of 90 inches per second. Storage density is 8,000 bits per inch, and transfer rates are 90 Kb per second (burst), 28.9 Kb per second (average). Included software provides for initial checkout, copying from hard or floppy disk to tape, and restoring files from backup to hard disk or floppy. The software also compares file dates so that the most current files of the same name are restored (preventing retrieval

of obsolete files).

Under the manufacturer's MULTI-OS control system, backup can be accomplished by volume or individual file. A 15 megabyte disk can be copied in about four minutes. (List Price: \$2,195) Davong Systems 217 Humboldt Ct. Sunnyvale, CA 94089 (408) 734-4900

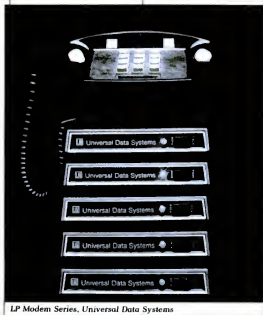
CIRCLE 781 ON READER SERVICE CARD

RS232 Analyzer

A device allowing the user to easily diagnose, monitor, and connect any device utilizing an RS-232 interface. The Analyzer can monitor nine signals and displays their status using bi-color L.E.D.s. In addition, one L.E.D. can be tied to monitor any RS 232 line.

Internally, the Analyzer has switches that allow cross-wiring of connections. The unit is a plug-in type adapter that may be left permanently wired in any circuit. (List Price: \$149.95) Personal Computer Products 1400 Coleman Ave., #C-18 Santa Clara, CA 95050 (408) 988-0164

CIRCLE 775 ON READER SERVICE CARD



LP Modem Series, Universal Data Systems



Bar Code Scanner & Interface, Control Module, Inc.

Bar Code Scanner and Interface Module

An optical scanning wand and interface module that can be linked to a user's system, allowing input of data from bar coded labels. The Model 1120 Interface Module lies in series between the keyboard and the systems unit, emulating the keyboard in the entry of bar code data. It does not require any alterations or modifications of hardware or software. The module can presently read eight different bar codes, and can be user-programmed to read up to three of these codes concurrently. Through an incorporated auxiliary keyboard port, standard ASCII data can be entered via the user's keyboard.

The Model 2901 Hand-

Held Scanning Wand is capable of reading both high and low density bar codes through the use of interchangeable read heads. Available in nine configurations, the wand can be customized to fit almost any application and needed read rate. (List Price: Model 1120 Interface Module \$1,100; Model 2901 Scanning Wand \$225) Control Module, Inc.

Enfield, CT 06082

(203) 745-2433

Telex: 64 3167

CIRCLE 796 ON READER SERVICE CARD

Scotsman III

A data compression device, compressing data at a two to one ratio, allowing communications and data transfers over phone lines to operate at twice normal speed. The unit uses encoding/decoding techniques and incorporated microprocessors to compress data, text, numerics, graphics, or facsimile transfers. Blocks of data are examined and abbreviated, permitting information to be transferred with half as many bits. At the other end of the data link, algorithms expand and reconstruct data to its original form.

The Scotsman III is compatible with asynchronous, bisynchronous, X.25, SDLC, and HDLC protocols, and

with standard RS-232 and V.24 interfaces. A Cyclic Redundancy Check is used to detect errors between data compression units.

A self-test mode allows the device to run through a battery of 15 diagnostic routines, testing the microprocessors, RAM, ROM, and other circuitry.

In addition, the device is available with an optional four-channel multiplexer. This option allows four 9600 bisynchronous, or two full-duplex 9600 bps lines, to be compressed and transmitted over a single 9600 bps line. (List Price: \$5,000) Rocol-Vodic
1525 McCarthy Blvd.
Milpitas, CA 95035
(408) 946-2227

CIRCLE 795 ON READER SERVICE CARD

Submissions to "New On The Market"

Inclusion in "New on the Market" is at the exclusive discretion of the PC Editorial Staff.

PC Magazine cannot guarantee publication of a product announcement for a particular issue. In any case, submissions of material for "New on the Market" must be received no later than seven weeks in advance of the first week of the issue month. For example, for the January, 1984 issue, all material must be in our hands no later than the middle of November, approximately 2 weeks before the ad closing date.

Submissions must include retail price, distribution methods, and details of required hardware and software. Include a phone contact for both marketing and technical questions.

The details for the product announcement should be submitted in typewritten form, double-spaced on one side of the paper. Whenever possible, include 8x10 glossy photograph of the product in black & white. If applicable, include screen photographs. For best quality, direct camera screen images are preferable to photographs from the monitor.

All material should be sent to: New on the Market, PC Magazine, 1 Park Ave., New York, NY 10016.

New On The Market

Light Pen

A light pen with electronic tip switch, applicable as an input device for plotting continuous or point-to-point graphics, selecting menu items, and moving objects around the screen. It can also control movement of the cursor and initiate programmed zoom of objects or of the entire screen.

When the light pen is touched to the screen, light produced by the beam is detected, amplified, and shaped into a TTL level pulse. The leading edge of this pulse triggers the switch circuit, which drops out when the pen is removed from the screen. Ambient light or contact with other objects cannot hold the switch circuit active.

The pen features fixed sensitivity. Under proper program control, it requires no adjustments to either the pen or the CRT display. It responds to all screen colors except black, and luminance levels can be compensated for through software adjustments of the delay time between detection of the switch and the reading of the pen coordinates. (List Price: \$39.95) Personal Computer Products, Inc. 2600 N.W. First Ave. Boca Raton, FL 33432

CIRCLE 775 ON READER SERVICE CARD



HP 7475A Plotter, Hewlett Packard

HP 7475A Graphics Plotter

A six-pen color graphics plotter, capable of resolutions as fine as 0.001 inches (0.025 mm). The unit can draw at speeds up to 15 inches per second, and can accept overhead transparency film or paper in sizes up to 11 x 17 inches (A3/B size).

Pens are selected from the six-pen carousel by either front-panel controls or through software commands. When returned to the carousel, pens are capped automatically to prevent dry-out. Other features include a pen-velocity com-

mand for special drawing conditions, a "view" mode that stops plotting to allow a user to review the chart being produced, and a feature that rotates charts 90 degrees, making it easy to incorporate a horizontal chart into a vertical format.

The device is compatible with an extensive range of graphics software. However, should users wish to do their own programming, the HP 7475A allows over 50 HP-GL (Hewlett-Packard Graphics Language) commands covering pen move-

ment, character selection, area fill, and scaling. (List Price: \$1,895) Hewlett-Packard Co. Inc. (Check telephone listings for local sales office)

CIRCLE 779 ON READER SERVICE CARD

CLASS-PC Security System

An access control system, built around a modified PC, providing a means for facility management and attendance data collection. The system provides the user with a tracking ability by which data and activity at entrances and exits can be retrieved by door, card number, date, and time. This information can be provided in report form, which can be printed simultaneous to system activity.

CLASS-PC, an acronym for Computerized Limited Access Security System for the IBM PC, has sensor points available for alarm monitoring, as well as output points used either in response to an alarm or activated by time of day. When used as a time clock, CLASS-PC collects data by badge entries and stores it for later use in payroll systems. (\$12,500, with PC) Requires: 128K, two disk drives, PC-DOS, clock/calendar card.

Applied Realtime Systems, Inc.

1908 Clearview Pkwy., #100 Metairie, LA 70001 (504) 456-0660

CIRCLE 785 ON READER SERVICE CARD



Wordstore Data Buffer, Production Technology International

Wordstore Data Buffer

A 64K, Centronics-compatible data storage buffer. Features include the compression of blanks and repetitive characters, multiple copy selection, a pause command, and automatic self-testing. (List Price: \$267)

Production Technology International
4740 Scotts Valley Dr.
Scotts Valley, CA 95066
(408) 438-3870
Telex: 35 7403

CIRCLE 776 ON READER
SERVICE CARD

Automatic Switching Unit

A switching device permitting either manual or automatic selection of peripheral devices through the user's system. The unit allows unmanned operation of peripherals under software control. Networking capability is enhanced through a specialized line driving function. When linked to a user's sys-

tem via modem, the Automatic Switching Unit permits remote site peripheral selection and operation.

The device incorporates self-diagnostic routines, fixed or automatic baud rate selection, user-defined port names (by which peripherals may be selected instead of by port number), user-selectable response format for computer-controlled switching, and a user-selectable identity code for secured access to peripherals. Available as options are front panel L.E.D. status indicators, manual override, display of selected port number, as well as a battery back-up power supply.

The unit is available in three models, with three, five, or seven ports. (List Price: \$459-\$866, depending on number of ports and options selected)
Giltronix
3780 Fabian Way
Palo Alto, CA 94303
(415) 493-1300
Telex: 34 5542

CIRCLE 782 ON READER
SERVICE CARD

GPIB-PC

An IEEE-488 instrumentation interface with software. The interface is provided on a plug-in card that occupies a slot in the user's system. It incorporates an NEC 7210 GPIB controller chip and a Programmable Array Logic chip, with a minimum number of circuit elements and only 8 I/O addresses. The card can support data transfers between the circuitry and the user's RAM and disk memory at rates up to 300 kilobytes per second.

Included software consists of a handler under PC-DOS 2.0 and subroutines that may be called from an

application program written in BASIC, 8088 Assembly, Pascal, Fortran, or C. In addition, an interactive control program is provided as a software development and debugging tool. The control program may be used to learn GPIB device programming, to measure system performance, to debug application programs, or to locate a malfunction on the GPIB card. (List Price: \$385)
National Instruments
12109 Technology Blvd.
Austin, TX 78758
(800) 531-5068
(512) 250-8119

CIRCLE 778 ON READER
SERVICE CARD



GPIB-PC, Notional Instruments

New On The Market

The Graduate

A system expansion device incorporating a Z-80B microprocessor, a fixed 5Mb hard disk drive, 320Kb of RAM, four RS-232 communications channels, an IEEE 488 interface, and a Centronics parallel port. Also included within the unit is Unisyn software,

consisting of a unified applications generator, a hierarchical database manager, a data dictionary, a file manager, and a programming language utility. The combined hardware/software package allows a user to create custom applications without complex programming procedures. The user

can input screens in business form format, then enter data on forms saved on disk. Unisyn also offers password protection, multi-level coaching, and help screens.

Available as an option for the Graduate is an additional 5 Mb removable-media disk or 320K floppy disk drive. (List Price: Basic

model \$3,450; with 320K Floppy Backup \$3,995; with 5 Mb removable cartridge \$5,350)

Unidoto Systems Inc.
Newington Pk.
Portsmouth, NH 03801
(603) 436-1100

CIRCLE 778 ON READER
SERVICE CARD

Communications Adapter and Cable

A communications adapter designed for use with Pathway communications software, allowing the users to link their systems to SNA and BSC type IBM main-frame systems. The Adapter plugs into an available slot in the user's system and can support line speeds up to 19.2K baud.

The Adapter is connected to a user's modem or modem eliminator via Pathway's shielded cable with 25-pin "D" shell male-type connector. The cable is approximately ten feet in length.

(List Price: Adapter \$295; Cable \$40)

Pothway Design, Inc.
177 Worcester St.
Wellesley, MA 02181
(617) 237-7722

CIRCLE 787 ON READER
SERVICE CARD

Sysgen II-10 and II-20

Two Winchester hard disk drives with streaming tape backup. The drives provide formatted storage of 10 megabytes (Sysgen II-10) or 20 megabytes (Sysgen II-20). Both drives are equipped with a streaming tape cassette backup which can operate at rates up to 2.5 me-



The Graduate, Unidata Systems Inc.

gabytes per minute.

The hard disk systems can be configured in up to ten logical volumes (can be made to appear to a user's system as floppy drives C: through L:) under PC-DOS. Under the CP/M-86 operating system, the drives can be configured in up to 14 logical drives (floppy drives C: through P:). Number and size of volumes are selectable by the user.

Utilities included with the Sysgen II systems include: **PRESERVE**, which saves and restores data on volumes equivalent to disk volumes in an image fashion; and **FILESAVE**, which saves and restores data as individual files or sets of files.

Both the II-10 and II-20 include direct memory access operation, parity checking, and error checking

codes. (List Price: II-10 \$2,995; II-20 \$3,795)
Sysgen, Inc.
47853 Warm Springs Blvd.
Fremont, CA 94539
(415) 490-6770
Telex: 49 90843

CIRCLE 796 ON READER SERVICE CARD

OMR-1000

A hand-fed optical card reader, providing the user with an alternative to the keyboard for data input. The OMR-1000 can read standard cards containing pencil marks, pre-printed data, or punched holes, and can accommodate cards ranging in length from 5 to 14 inches. (List Price: \$1,095)
Chotsworth Data Corp.
20710 Lassen St.
Chotsworth, CA 91311
(213) 341-8200

CIRCLE 790 ON READER SERVICE CARD



OMR-1000 Card Reader, Chotsworth Data Corp.



IDEAComm 1200, IDEAssociates, Inc.

IDEAComm 1200

A plug-in board offering a 300/1200 baud integral modem incorporating the functions of an in-board asynchronous card. The board contains an RS-232 interface that can be used as a serial port, and an additional plug for a telephone jack. Operating speed can be selected by user's software or automatically by the board.

Included software allows menu-driven selection of the board's communication, auto-dial, and auto-logout procedures. Help screens and prompts are included to assist the user in operating the board. (List Price: \$545)
IDEAssociates, Inc.
7 Oak Park Dr.
Bedford, MA 01730
(617) 275-4430
Telex: 94 8245

CIRCLE 771 ON READER SERVICE CARD

Daisywheel Printer

A daisywheel printer with both word processing and graphics print modes, the Juki Model 6100 printer utilizes an IBM Selectric II ribbon and provides 10, 12, and 15 pitch and proportional spacing. The Juki employs a drop-in, 100-character daisywheel and has a bidirectional printing speed of up to 16 characters per second. The standard platen is 13 inches, and a bi-directional tractor feed is available as an option.

Internal buffer capability is 2K standard, with optional expansion to 8K. The printer includes a Centronics parallel interface, with serial RS-232 interface available as an option. (List Price: \$699)
Vitek
930-G Boardwalk Ave.
San Marcos, CA 92069
(619) 744-8305

CIRCLE 783 ON READER SERVICE CARD

New On The Market

SOFTWARE

PC-PLOT

A graphics terminal emulating program, permitting a user to link to an RS-232 local network or modem for access to mainframe computer graphics programs such as DISSPLA and TELL-A-GRAF, SAS Graph, Tektronix PLOT-10, as well as dial-up services such as Chemical Abstracts' CAS-ONLINE and similar graphics databases.

PC-PLOT is available in three versions. PC-PLOT-I offers virtual emulation of the Tektronix Model 4010 graphics terminal. PC-PLOT-II contains the basic program plus extended features allowing local printer control for ASCII listings, saving picture files to diskette, scaling of images after they have been saved, printing graphics images on an IBM printer (with PC-DOS 2.0) or Hewlett Packard plotter, and a serial communications debug mode for locating control characters imbedded in picture or text files.

PC-PLOT-II+ is a special version of the above program, designed for use with the Plantronics/Frederick Electronics ColorPlus adapter. This version also recog-

nizes the color set and line draw commands of the Tektronix 4027 color graphics terminal. (List Price: PC-PLOT-I \$40; PC-PLOT-II & II+ \$75)

Requires: 64K, one disk drive, PC-DOS 1.1 or 2.0, async communications adapter, color/graphics card. MicroPlot Systems
1897 Red Fern Dr.
Columbus, OH 43229
(814) 882-4788

CIRCLE 763 ON READER SERVICE CARD

FABS/PC

An 8086/8088 assembly language subroutine designed to provide rapid access to very large data files (up to 65K records, depending upon the size of the key). Variable length keys and duplicate keys are supported. Multiple primary keys can be maintained in a single tree providing primary access to data files on more than one key. ASCII keys can be specified (up to 100 bytes). Integer keys (0 to 85535) can be specified to occupy only 2 bytes in the tree. Multi-level sequencing is supported.

FABS/PC (Fast Access B-Tree Structure for the IBM PC) maintains data record keys in a key-sequence, multi-path, balanced tree structure. The subroutine's commands include: Create, Open, Close, Search, Generic Search, Search Next, Search Previous, Search First, Search Last, Insert, Delete, Replace, Get Number of Data Records, Get Num-

ber of Open Deletes, Get Number of Primary Keys, Get Maximum Key Length, Get Next Record Number, Build File, and Write Map File. The Search Next and Search Previous commands provide sequential access to data file.

The subroutine occupies 14.6K bytes of memory, and can be incorporated into existing programs. Included with the package is NAMADD, a name and address file in BASIC; demonstration and test programs; and a manual for implementation of the subroutine with IBM BASIC Interpreter. (List Price: \$150)
Requires: 64K, one disk drive, PC-DOS, any DOS-compatible programming language.

Computer Control Systems, Inc.
298 21st Terr. S.E.
Largo, FL 33541
(813) 566-1888

CIRCLE 765 ON READER SERVICE CARD

DISPATCH

A mail order fulfillment program, utilizing a perforated multipurpose form which incorporates two mailing labels, a packing list showing product and financial information summary, a VISA/MasterCard sales draft, and a refund check or credit memo.

The program can maintain inventory records, supports on-line customer service, and produces marketing reports about source codes, back orders, and inventory. Back orders are updated automatically. The system also contains mailing list and accounting functions. (List Price: \$2,495)

Requires: 128K, two disk drives, PC-DOS, monitor. Professional Publications, Inc.
P.O. Box 199
San Carlos, CA 94070
(415) 593-9119

CIRCLE 726 ON READER SERVICE CARD

HOMER PRESS
INTERNATIONAL
DISPATCH ORDER PROCESSING SYSTEM
PROFESSIONAL ENGINEERING REGISTRATION PROGRAM
Version 1.0 Copyright 1981, 1982, 1983
06/01/83

MAIN MENU

00 SET TODAY'S DATE
01 ORDER ENTRY
02 AUTHORIZATIONS SUB-MENU
03 SAVE ORDERS
04 FULL ORDERS SUB-MENU
05 CUSTOMER NOTIFICATION
06 REPORT SUB-MENU
07 UPDATE REFUND REGISTER

08 LOCATE AN ORDER
09 CHANGE AN ORDER
10 DELETE AN ORDER
11 REACTIVATE AN ORDER
12 PRODUCT FILE SUB-MENU
13 END-OF-YEAR PROCESSING
14 SYSTEM PARAMETERS
15 UTILITIES SUB-MENU

EXIT EXIT THE PROGRAM

SELECT OPTION

DISPATCH, Professional Publications, Inc.

Financial Horizons

A menu and function key driven program that analyzes and illustrates available options to terminating or retiring participants of profit sharing or pension plans. The program selects the best tax option for a lump sum immediate payout, and compares it to tax deferral methods such as IRA Rollover or a Terminal Funding Deferred Annuity, using present value analysis of the investment options available to the plan participant.

Output includes tax form input, comparisons of IRA Rollover versus 10-year averaging (with or without capital gain), and a detailed comparison of various investment alternatives such as single premium whole life contracts.

The program allows financial planners, attorneys, accountants, and trust officers to use it in two ways. One use is in developing "what if" comparisons for planning. The other manner is in generating a formal 12-page report for presentations, illustrating 25 year future projections. The software package includes six forms for data gathering and operator input. (List Price: \$550)

Requires: 64K, one 320K disk drive, PC-DOS. Horizons Computer
117 N. First, #107
Ann Arbor, MI 48104
(313) 761-3155

CIRCLE 754 ON READER SERVICE CARD



Organization Map, Pacesetter Software

Organization Map

A human resources management and productivity improvement program. Organization Map can be used by managers in the making of organization charts, in assisting manpower/succession and career path planning, in monitoring and controlling compensation costs, and as an aid in corporate reorganizations.

The program consists of two major components. The first, Human Resources Decision Support System, provides a complete description of an organization's structure, including layers of management, spans of control, and staffing levels. The system also provides the user with a human resource information system, tracking a variety of key facts on each employee as well as the characteristics of the overall workforce.

The second component, Organization Analysis and Productivity Improvement Support System, presents the user with a detailed

view of the work activities taking place within the organization, where these activities take place, and their costs. (List Price: \$8,500; demo disk \$35)

Requires: 128K, two disk drives, PC-DOS 1.1 or 2.0, graphics monitor, color/graphics card, graphics printer or plotter. Pacesetter Software
P.O. Box 5270
Princeton, NJ 08540
(609) 737-8351

CIRCLE 766 ON READER SERVICE CARD

BASIC Development System (BDS)

An integrated set of software tools for programming in BASIC. BDS attaches itself to the BASIC Interpreter, allowing the user to immedi-

ately access the software's features.

BASIC Development System's features include: Single Step Trace, a pause before software executes the next line of a program, requiring keyboard input before software continues execution. The line number is placed in the corner of the screen and does not interfere with program displays.

Cross-Reference provides a sorted list of every BASIC keyword, numeric and string constant, line number, and variable name used in the program and shows where each item is referenced.

Super Renum allows the programmer to renumber, relocate, or duplicate any block of program lines.

Variable Dump lists all program variables along with their current values.

Compress reduces the program's size to a minimum, leaving space for variables and string data and increasing the program's execution speed.

Uncompress expands the compressed program to make it more readable. (List Price: \$79)

Requires: 64K, one disk drive, PC-DOS, BASIC Interpreter.

SoftTool Systems
8972 E. Hampden Ave.,
#179
Denver, CO 80231
(303) 793-0145

CIRCLE 756 ON READER SERVICE CARD

New On The Market

Business Planning Tool (BPT)

A financial budgeting and forecasting tool that can also be used to generate complex templates for spreadsheet programs such as VisiCalc, MultiPlan, and 1-2-3. With the Business Planning Tool, a user is not required to learn programming commands or special symbols. All formatting is automatic. An account is defined by positioning the cursor at the desired location and typing in an account name. Account type is then selected and numeric data entered via a "fill-in-the-blank" format. Account type is further defined by its position in the worksheet.

The Business Planning Tool also incorporates a twelve-month "time window" that presents a display of possibilities or an analysis of facts. To evaluate future effects of existing trends, the user may move the time window forward. The income statement and balance sheet are automatically updated according to the assumptions contained in each account description.

Another feature of BPT is its "Graph" screen, used to display a horizontal bar graph of an account. All data or any individual component (i.e. constants, interrelations, or base/trend and seasonal variations) of an account can be displayed or edited. Editing of the graph is through the arrow keys, used to manually extend or

shrink a bar on the graph. The newly shaped bar then becomes input for the program.

Output is in the form of a report directly from BPT, or the program can generate a template complete with all formulae that mathematically describe the assumptions entered, for use with a spreadsheet program. (List Price: \$195)

Requires: 128K, one disk drive, PC-DOS.
Sofstar, Inc.
13935 U.S. Hwy. #1
Juno Beach, FL 33408
(305) 627-5511

CIRCLE 798 ON READER SERVICE CARD

Scientific Software File System

A menu-driven database management program. The file format is user-customizable with up to 15 fields. Standard data editing capabilities are supported, and utilities include sort; multiple key search with sub-strings; global search; and basic arithmetic functions, allowing the sum of any field or the sum of mathematical operation on any two fields to be calculated.

Printouts include tables and mailing labels. (List Price: \$59.95)
Requires: 64K, one disk drive, PC-DOS, monochrome display, BASICA.
Scientific Software
2 Sequoia Tree Ln.
Irvine, CA 92715
(714) 857-8376

CIRCLE 725 ON READER SERVICE CARD

visuALL

A program creating windows on the display screen listing functions and commands for PC-DOS and a number of applications programs. The user, utilizing either a digital mouse or the cursor control keys on the keyboard, points to the desired command or function to activate it.

The visuALL program contains a window library for a number of applications programs, including the IBM Personal Editor, WordStar,

and Lotus 1-2-3. It is task-oriented and user-modifiable, allowing it to be adapted to any application, creating consistent interfaces to all applications. (List Price: \$299; with mouse \$495)

Requires: 64K, one disk drive, PC-DOS 1.1 or 2.0, monitor.
Trillion Computer Corp.
P.O. Box 481
Los Gatos, CA 95031
(408) 374-5001

CIRCLE 742 ON READER SERVICE CARD



visuALL, Trillion Computer Corp.

Digital Research C

A full-featured implementation of the C programming language. Digital Research C provides a machine code compiler with error warning and reporting facility; the compiler's command line option switches accommodate direct control over aspects of the compilation process, providing the programmer with access to compiler-generated listings and interlistings. Other features include multiple memory model and chaining support, programming and debugging aids, single and double precision arithmetic, I/O redirection, plus full compatibility with the UNIX Version 7 C language standard defined by Kernighan and Ritchie.

Digital Research C can support the IBM 8087 Math Co-processor, and the run time library includes a set of double precision floating point functions. (List Price \$600)

Requires: 128K, one disk drive, CP/M-86 or PC-DOS. Digital Research
P.O. Box 579
Pacific Grove, CA 93950
(408) 649-5500
TWX: 910-360-5001

CIRCLE 762 ON READER SERVICE CARD

Inventory Management System Version 2

A new release of the Inventory Management System, offering complete inventory control, bills of materials and sales and purchase orders processing facilities. The program allows multiple locations, variable-length part numbers, automatic markups and price calculations, weighted average and standard costs, four price levels, user-definable reports, plus multi-company and multi-user capabilities.

Reports generated include master parts listing;

departmental summaries; transaction, journal and purchasing variance; sales analysis; projected margins; and reorder, overstock, on-order and detail reports. The software can also print purchase orders, price lists, sales orders, invoices, bin labels, price tags, and physical inventory sheets. (List Price: \$1,095)

Requires: 64K, one disk drive, PC-DOS. CYMA Corp.
2160 E. Brown Rd.
Mesa, Az 85203
(602) 835-8880

CIRCLE 738 ON READER SERVICE CARD

KEYTOOLS

A package of programming utilities and tools for working in Advanced Basic under PC-DOS 1.1. KEYTOOLS includes the following: P/CASSO, a multi-faceted screenmaker, capable of producing a variety of special graphic effects for text on screen; EMERSON, a formatted data entry subroutine, providing insert and delete edit functions, keyboard character restrictions, and allowing the user to customized fields for specific patterns of input; SOCRATES, a utility for building on-line "help" screens; and



Inventory Management System, CYMA Corp

New On The Market

YOUNGMAN, a collection of "one-liners"—brief Basic routines that perform functions common to many programs.

The package is supplied on two double-sided diskettes, and includes a manual and reference card. (List Price: \$40)

Requires: 64K, two 320K drives, PC-DOS 1.1, color or monochrome display.

KEY-1 Computer Systems
178 Spring St.

Newport, RI 02840
(401) 849-4562

CIRCLE 744 ON READER SERVICE CARD

ZURAN

A game program wherein the player's mission is to rescue survivors from damaged ZURAN spaceships, simultaneously defending against sudden attack from ECLON ships, outposts, and mines. The game creates a galaxy of nine quadrants through which the player moves a ship using the cursor control keys.

ZURAN makes use of defensive shields, hyperspace, energy refueling outposts, and long range scanning to detect enemy activity. The ten highest scores are preserved on the game diskette. (List Price: \$32.50)

Requires: 64K, one disk drive, PC-DOS, color or monochrome display, color/graphics adapter.

ZEE Programming
P.O. Box 340142
Boca Raton, FL 33434
(305) 487-2172

CIRCLE 744 ON READER SERVICE CARD

smarTelex

A communications program, available in three separate versions, that can link a user's system to International Telex (50 baud); Western Union's AUTOSAFE (providing message store and forward services) and Domestic Telex systems; and to Western Union's Easylink system, providing electronics mailbox, message store and forward, and a connection to other communications networks such as TWX.

The program allows the user to include other programs to the main menu. It can be used with any word processor program creating ASCII files.

smarTelex options include Correspondent Directory, providing a listing of Telex numbers, answers, as well as name and address information. (List Price: \$449.95)

Requires: All versions: 64K, two disk drives, PC-DOS, async communications port; Telex versions: F1-F2 Modem; Easylink version: Hayes Smartmodem. Coppcomm Software, Inc. One World Trade Cntr., #1043

New York, NY 10048
(212) 938-5702

CIRCLE 752 ON READER SERVICE CARD

PLOTCALL Graphics System

A graphics program allowing novice users to create charts and drawings annotated with text or special symbols. The program permits the user to access a dot matrix printer as if it were a plotter, without requiring a graphics card or additional hardware.

Plots can be generated by any programming language or from a digitizer. The software interprets commands placed by the user in data files. (List Price: \$149)

Requires: 128K, one disk drive, PC-DOS, dot matrix printer.

Golden Software
P.O. Box 281
Golden, CO 80402
(303) 379-1021

CIRCLE 746 ON READER SERVICE CARD

TranscriptStar

A school transcript program that can record up to 1,000 student transcripts. Full instructions are displayed on the screen throughout the use of the program. (List Price: \$195)

Requires: 64K, two disk drives, PC-DOS, monitor, printer.

DEC Computing
609 Oakleaf Dr.
Garett, IN 46738

CIRCLE 750 ON READER SERVICE CARD

PC Tutor 2.0

An interactive tutorial program for learning PC-DOS (MS-DOS) commands. The program covers PC-DOS version 2.0 enhancements such as Directory Structure, Batch Commands, Filters, Pipes, and Redirection, along with new commands.

The program is supplied on a plain English diskette and instruction manual. (List Price: \$59.95)

Requires: 64K, one 320K disk drive, PC-DOS. Comprehensive Software
2316 Artesia Blvd., #B
Redondo Beach, CA 90278
(213) 316-2561

CIRCLE 752 ON READER SERVICE CARD

The Bond Bidder

A program for municipal bond underwriting which can calculate True Interest Costs (TIC), Net Interest Costs (NIC), spread, and other information for serial and term issues. Features include the ability to change couponing, re-offering levels, bid premiums, or discounts. An incorporated optimizing capability allows the user to calculate optimum spreads per offering. (List Price: \$3,500)

Requires: 64K, two disk drives, PC-DOS, monitor, printer.

Piedmont Software Co.
5200 Park Rd., #119
Charlotte, NC 28209
(704) 527-0117

CIRCLE 748 ON READER SERVICE CARD

STYX

A game program in which a player ventures into uncharted territory to stake a claim against the bewitching, swirling STYX, who have laid seige against the player. The player's aim is to advance into the playing field and corner off an area. To win each round, the player must capture at least 80% of the playing field.

The STYX guardians that travel the edge of the field have an electric barrier capable of destroying a player's marker on contact. If any part of the STYX touches the player's line before the area has been completely marked off as captured, the marker is also destroyed and the area lost.

The game allows use of joystick controllers or keyboard, records ten best scores, and includes a pause control and sound on/off. (List Price: \$39.95)

Requires: 64K, one disk drive, color monitor, color/graphics adapter.
Windmill Software Inc.
2209 Leominster Dr.
Burlington, ONT.
Canada, L7P 3W8
(416) 336-3353

CIRCLE 717 ON READER
SERVICE CARD

SmartKey II

A background utility program that allows a user to customize a keyboard to reflect the needs of software. All keys, including special function keys, may be redefined at will to become software commands or commonly used words, phrases, or boilerplate text.

Definitions may be changed at any time, even while another program is in operation. Definitions can be saved to a disk file.

Additional features of SmartKey II include instantaneous installation of special function keys; an expanded buffer able to handle up to 3,750 definitions at one time; a text compiler that can reduce entire text files to a single keystroke; and a built-in editor for complex reorganization of key definitions.

The program is compatible with most applications software, including WordStar and dBASE II. (List Price: \$69)
Requires: 64K, one disk drive, PC-DOS or CP/M-86.
Heritage Software
2130 S. Vermont Ave.
Los Angeles, CA 90007
(213) 737-7252

CIRCLE 740 ON READER
SERVICE CARD

PRESS 'N PLOT

A color graphics screen capture and print facility for users' systems equipped with PRISM printers. The program allows a user to capture an image, print it, save it, rotate it 90 degrees left or

right, intensify colors, have it printed anywhere on a page, change color ribbon selections, invert black/white portions of images, control printer ports, control paper movement from the keyboard, and print screens of text. The program is invoked using a Shift-PrtScr command. (List Price: \$149)
Requires: 96K, one disk drive, PC-DOS 1.1 or 2.0, color monitor, color/graphics card, PRISM printer with Color Option and Dot Plot Graphics Option.
American Programmers Guild, Ltd.
55 Mill Plain 17-5
Danbury, CT 06810
(800) 828-8088
(203) 794-0396

CIRCLE 723 ON READER
SERVICE CARD

REAL ESTATE TOOLS I

A software package consisting of 45 menu-driven analysis routines for mortgages, leases (level and uneven payment), construction loans, and grouped and variable cash flows together with their respective amortization schedules. Analyses include Internal Rate of Return, Net Present Value, Financial Management Rate of Return, price to pay, points, yield, and others, computed in double precision arithmetic. Cash flows of up to 12 digits can be handled by

the software.

REAL ESTATE TOOLS I is written in BASIC, and the package includes manual and two program diskettes. (List Price: \$299)
Requires: 128K, two 320K disk drives, PC-DOS.
Annsohn Software, Inc.
2801 N. Surrey Dr.
Carrollton, TX 75006
(214) 446-4340

CIRCLE 761 ON READER
SERVICE CARD

AMP-PC

An assets management program allowing securities transactions to be recorded under tax-lot (FIFO, LIFO, High Cost, Low Cost) and average accounting methods. AMP-PC has provisions for sector analysis, portfolio performance measurement, and for modeling and forecasting. Prices may be changed in real-time, immediately affecting all produced reports.

The program can produce over 20 reports, including operational and client oriented trade blotters, holdings and forecast evaluations, realized and potential gain and loss reports, and performance measurement on absolute, comparative, and strategic bases. (List Price: \$1,000)
Requires: 256K, 10 MB Hard Disk, PC-DOS 2.0.
Securities Information Services, Ltd.
23 E. 10th St.
New York, NY 10003
(212) 460-5053

CIRCLE 748 ON READER
SERVICE CARD

New On The Market

OMNIFILE

A database management system with report-writing capabilities. OMNIFILE reports include up to four sort levels, with totals, subtotals, counts and averages for each level. Calculated fields and multiple conditions are also supported.

The program uses common English commands. A special "How to" section in the user's manual provides information on setting such business applications as case docketing for attorneys, client dossiers for insurance professionals, sales productivity reports for managers, appointment scheduling for doctors and dentists, and personnel files for business managers.

The report-writing capability of OMNIFILE includes the ability to select information to be included in a report from a list displayed on-screen. (List Price: \$425) **Requires:** 128K, two disk drives, PC-DOS. S.S.R. Corp. 1600 Lyell Ave. Rochester, NY 14606 (716) 254-3200

CIRCLE 766 ON READER SERVICE CARD



OMNIFILE, S.S.R. Corp.

VC-DOCUMENTOR

A utility program for VisiCalc files which uses the row and column headings of the spreadsheet's models to print in English the definition of each cell address. The program can list cells by row/address or vice versa, and allows the user to print all or selected parts of a model.

For example, what VisiCalc would list as >B3:+B1-B2 is instead listed by VC-DOCUMENTOR by the row and column headings defined by the user, such as "1983 Gross = +1983 Sales - 1983 Cost." VC-DOCUMENTOR operates

independent of the spreadsheet program, and can handle without limitation models of any size or complexity. (List Price: \$49.95) **Requires:** 64K, one disk drive, PC-DOS 1.0 or 1.1, files in VisiCalc format. Desktop Solutions, Inc. P.O. Box 35659 Houston, TX 77235 (713) 723-6170

CIRCLE 743 ON READER SERVICE CARD

STATMAP

A demographic map-producing program which can accept data from user's files, dBASE II files, or from census data tract files. STATMAP provides an interactive database from which demographic data is drawn to create maps. Once generated, maps may be stored for later retrieval or for organization into a presentation through video display or hard copy printout.

User-addressable options available with STATMAP include a palette of up to 16 colors; definition of plotter "hatching" patterns; legend layout and content; titles; as well as a "clip and zoom" option, permitting detailed mapping of select portions of a displayed map.

The user may also generate a line printer report of data used to create a map, thus providing tabular as well as graphic output. (List Price: \$2,500) **Requires:** 128K, two disk drives, PC-DOS 1.1, color monitor, color/graphics board, serial interface, plotter.

GANESA Group International, Inc. 1495 Chain Bridge Rd. McLean, VA 22101 (703) 442-0442

CIRCLE 721 ON READER SERVICE CARD



PAPERWORK, Harris Microcomputers, Inc.

PAPERWORK

A word processing program with capabilities including a line/screen editor and a mailing list address database. The program's editor works in two modes, "line" and "pseudo-screen." The "line" mode automatically assigns a reference number to each line of text, allowing global searches and replacement, text line movement, and line insertions, without needing to position cursor within the lines. Line commands include Add, Adjust, Copy, Delete, Insert, Locate, Move, and Replace.

The "pseudo-screen" mode allows changes to text to be made on screen through cursor movements made by the user. Screen capabilities include rapid cursor movement within a line, floating left-hand margin

mode, character insertions, and character-for-character exchanges.

The editor also allows dynamic tab and margin setting, auto wrap-around at the right margin, boldface, underlines, 132-character lines with embedded text commands allowing headings, subheadings, line spacing, page ejection, etc., to be made as the document is being printed.

The mailing list database feature of PAPERWORK allows the user to merge name and address information into letters automatically. Each entry in the database consists of a mailing address, three dates, four phone numbers, a search key, a reference number, a user-defined category number, a letter greeting line, letter merge information, and a variable length note field. Search and retrieval routines allow the user to select data using any of the

following criterion: a string match within the address; a category number list; a reference number range; a search key list; a relational operation list based on any or all stored dates; a zip code list; or a string match within the user-defined note field. The user may define up to 62 categories into which the address may be classified.

An update command allows simplified database maintenance, and a purge command allows selected addresses to be deleted from the database easily. Enter and change commands allow individual addresses to be modified or added as desired. (List Price: \$69.95)
Requires: 128K, one 320K disk drive, PC-DOS, Basic Compiler Run Time Module, monitor, printer.
 Harris Microcomputers, Inc.
 2560 N. 560 E.
 Provo, UT 84604
 (801) 373-1605

CIRCLE 738 ON READER SERVICE CARD

ICC INTERCOM 100

A program permitting a user's system to emulate a Burroughs MT983/TD830 terminal. The program will simultaneously support up to six addresses—four addresses for concurrent operator dialogues or for bidirectional data transfers, and one for background printing. The sixth address is reserved for future upgrades.

Features of the ICC INTERCOM 100 program in-

clude an on-line disk file transfer utility, data communication line monitor mode, and data transfer rates from 50 to 9600 baud using the IBM asynchronous communications adapter or equivalent. (List Price: \$99)
Requires: 64K, one disk drive, PC-DOS, monitor, asynch. communications adapter.

Intercomputer Communications Corp.
 3195 Linwood, #2A
 Cincinnati, OH 45208
 (513) 321-3199

CIRCLE 737 ON READER SERVICE CARD

Basic Accounting System

A General Ledger program consisting of 30 separately compiled modules yielding a balance sheet, income statement, and statement of owners' equity. The program is written in compiled BASIC, and gives the user a choice of closing by month, quarter, or year. Up to 300 separate accounts are allowed in the program's Chart of Accounts. The program allows 750 journal entries in each accounting period, or 1500 account references if more than two ac-

New On The Market

counts appear per entry. Each journal entry is assigned a serial number within the current year to facilitate auditing.

Financial reports are customized with a personal, family or company name appearing on the heading of the printouts. Each print-out is semi-structured, with the variance resulting from the number and names of user-assigned accounts. In addition to the three principal financial reports, summaries of individual account activity and current balance are on call, as well as special callouts of all current accounts receivable and payable. Complete general journal and general ledger listings are printed at time of closing.

A utility program for data file status and maintenance is present, as is a program for depreciation schedules and three utilities for printing, tabbing, and appending text files built with the ED-LIN editor.

Password protection is built in to the program. User inputs are edited to prevent unwanted crashing. (List Price: \$119)

Requires: 128K, two disk drives, PC-DOS 1.1, monitor, printer.
Fox Custom Systems
P.O. Box 161
Hendersonville, TN 37075
(615) 822-6266

CIRCLE 72 ON READER
SERVICE CARD

Farm Ledger and Hog Management Programs

An accounting program designed for farmers, *Form Ledger* allows users to maintain records of all cash, check, note, and account transactions. The program allows the user to set up accounts and expense categories using names instead of numbers. The *Hog Management Package* is a farrow-to-finish pork production recordkeeping program. The program can monitor and analyze central production factors, pinpointing high producing livestock and best-alternative management practices. The program can keep track of individual litters through finishing, or weight gain and feed conversion data by pens. (List Price: *Farm Ledger* \$250; *Hog Management* \$300)
Requires: Both programs: 64K, one disk drive, PC-DOS.

Harvest Computer Systems
102 S. Harrison
Alexandria, IN 46001
(317) 724-9527

CIRCLE 76 ON READER
SERVICE CARD

MAX, The Production Manager

A program for planning and controlling inventory, production, and purchasing for small companies or divisions of large companies. The initial release of the software includes a set of six integrated modules that

provide Bill of Materials Maintenance, Inventory Control, Master Scheduling, Material Requirements Planning, Shop Floor Control, and Purchasing Control. Planned future releases include modules for accounting, order entry, capacity planning, and management performance reporting capabilities. (List Price: Complete System \$15,995; Individual Modules \$4,995-\$6,995)

Requires: 320K, one disk drive, 10 MB Hard Disk, PC-DOS 2.0, monitor, printer.
Micro MRP, Inc.
1065 E. Hillside Blvd.
Foster City, CA 94404
(415) 345-6000

CIRCLE 79 ON READER
SERVICE CARD

Material Optimization & Selection

A program to assist in selecting manufacturing materials, allowing the user to choose the most economical options. The program works for rectangular plates and sheets, in steel, aluminum, copper, brass, and other metals.

The user enters required size, quantity, and all available sizes in stock for a given thickness. The program makes the most economical selection, with a minimum of scrap. (List Price: \$95)

Requires: 64K, one disk drive, PC-DOS, monitor.
Unik Associates
12545 W. Burleigh
Brookfield, WI 53005
(414) 782-5030

CIRCLE 81 ON READER
SERVICE CARD

Formatted File Manager

A database management program. The user interacts with the program through electronic forms that identify the function to be performed as well as the data that must be entered. Users may also set up their own forms for interfacing with their own programs.

A form may be generated for accessing commercial databases; when used in this manner, data may be accessed sequentially, by an index or a record number. Forms may be 80 columns by 23 lines, or 40 X 23 if the color/graphics card is installed in the user's system. Data fields in a form may be numeric or non-numeric, and up to one line in length. As many as 175 fields may be defined per form. Field attributes are user-programmable, and access to a form may be password restricted.

Utilities are provided for sorting, changing index fields or file structure, appending data files, creating a subset of a data file, as well as for global editing. (List Price: Basic system \$225; Report/Sort Option \$70)

Requires: 128K, one disk drive, PC-DOS.
Exim Services of N.A.
P.O. Box 5417
Clinton, NJ 06809

CIRCLE 78 ON READER
SERVICE CARD

ACCESSORIES

Pagamate Easel

A book holder and typing easel constructed of non-magnetic plastic, designed to accommodate almost any size book, programming manual, or loose pages. Accessories available include extenders for hard back and thick publications, which allow the user to hold pages in place on any hardcover book or thick manual up to 13 3/4 inches high. Amber "Line-A-Timers" are also available, transparent plastic line locators that adhere to any page and permit easy movement and place location. (List Price:

Basic unit \$19.95; with accessories \$27.95)
Pogemote, Inc.
6166 E. 44th St.
Tulsa, OK 74145
(916) 627-7440

CIRCLE 711 ON READER SERVICE CARD

PC-Saver

A dust cover that fits into the disk drive or hard disk opening of the systems unit. The device contains a printed card showing a summary of operating commands. (List Price: \$9.95)
ColorCorp
208 N. Berkshire
Bloomfield Hills, MI 48013
(800) 521-0793
(313) 335-2255

CIRCLE 716 ON READER SERVICE CARD



PC-Saver, ColorCorp

Computer Covers

A line of fitted dust covers made of a washable cotton/polyester blend. Available colors include grey with navy piping, or beige with wine piping. The covers are designed to fit over an entire system (systems unit, monitor, and keyboard), when placed in the standard configuration. Separate unit covers are also available.

For an additional charge, the manufacturer will silk-screen a company's logo onto the covers, and for orders over 500 pieces, custom colors are available. (List Price: \$10-\$30, depending upon model)
CJ Computer Covers
3338 O St. N.W., #204
Washington, D.C. 20007
(202) 338-7308

CIRCLE 706 ON READER SERVICE CARD

Diskstand

A diskette temporary storage device, allowing an operator to stand diskettes on desk between uses, or diskette envelopes when the diskettes themselves are in use. When not in use, the unit can be stored either in a desk or in a two or three hole binder. Diskstand comes in five colors: white, sand, grey, brown, and black; and sizes for 5 1/4-inch and 8-inch floppy diskettes. (List Price: \$12.95)
DAMONICS
P.O. Box 132
Corning, NY 14830
(607) 524-8328

CIRCLE 709 ON READER SERVICE CARD



Sound Training, Information Systems Resources

Sound Training

Audio cassette based instruction in the use of major software programs, such as WordStar and MailMerge, MULTIPLAN, Lotus 1-2-3, PC-DOS, dBASE II, SuperCalc, and Personal Pearl. (List Price: \$69.95 each)
Information Systems Resources, Inc.
1444 Balsam St.
St. Paul, MN 55122
(612) 452-7913

CIRCLE 708 ON READER SERVICE CARD

Continuous Forms for Personal Computers

A new line of personal computer continuous form kits. The line consists of the following packages:

Kit # MF201- 3 1/2 x 15/16 inch Labels. Contains 4000 labels, 1000 each in pink, blue, yellow, and white.

Kit # MF205- 500

New On The Market

sheets of 8½ x 11 inch stationery with clean-edge perforations. Also, 200 continuous #10 size envelopes.

Kit # MF207- Continuous Index Card Kit. Four varieties of colored index cards, 3 x 5 inch detached. 500 cards each in yellow, blue, green, and red.

Kit # MF209- Large index Card Kits. Same as MF207, but in 4 x 6 inch size when detached.

Kit # MF211- Continuous Rolodex-Style Cards- 3 x 5 inch Rolodex-type cards, 500 each in yellow, blue, green, and red. (List Price: MF 201 \$25; MF 205 \$25; MF 207 \$30; MF209 \$49.50; MF211 \$39.50)

Micro Formot
1271 W. Dundee Rd.
Buffalo Grove, IL 60090
(312) 537-2426

CIRCLE 705 ON READER SERVICE CARD

Accent Computer Furniture

A line of computer furniture available in a range of veneer finishes, including oak, teak, rosewood, and walnut. Worktables are available in 36 inch and 48 inch models, and feature detachable monitor and peripheral shelves. A matching printer stand is also available. (List Price: Worktables: 36-inch \$300; 48-inch \$340; Printer Stand: \$300)

Accent
7587 Clio Rd.
Dayton, OH 45459

CIRCLE 707 ON READER SERVICE CARD

PUBLICATIONS

Microprocessor Support Chips

A practical one-volume compilation, *Microprocessor Support Chips: Theory, Design, and Applications*, by T.J. Byers, presents data on more than 100 interface chips used to support micro-processors in circuitry. Providing schematics of chips in operating environments, the book describes each chip, gives specifications and parameters, shows pin connections and logic diagrams, and describes applications circuits.

Details and information for each chip are provided on two facing pages. The book covers six major categories of chip functions: telecommunications, power supply, interface, control, video, and analog/digital,

digital/analog conversion. It includes cross-references by part number and circuit function, allowing desired data to be located readily. (224 pgs., \$38)

McGraw-Hill Book Co.
Professional & General Books
1221 Ave. of the Americas
New York, NY 10020
(212) 997-3493

CIRCLE 703 ON READER SERVICE CARD

Computer Evaluation Program

An audio cassette program outlining an introduction to the capabilities and capacities of microcomputer systems and software. The program is entitled: "Five Keys to Greater Success and Profits With Your First Computer." Included with the two-cassette package is the Business Evaluation Questionnaire, a series of multiple choice questions which the user answers and forwards to the program's publishers for evaluation. Answers are evaluated and objective purchase recommendations are sent to the user, based upon the information the user has submitted. (List Price:

\$14.95)
Success Systems Unlimited
124 Poul Dr., #105
San Rafael, CA 94903
(415) 492-0406

CIRCLE 698 ON READER SERVICE CARD

Computer Furniture: Accent



Hardware/Software Retailers Directory

A market reference guide to retail computer and software stores. The 1983 Directory of Computer & Software Retailers offers listings of 2,625 computer store companies operating 12,500 stores, as well as 700 computer and software distributors. Listings show the names, addresses and telephone numbers of companies; their product lines and brands; services provided; store locations and distribution centers; sales volumes; type of ownership; the names of executives, and the names of buyers for the companies. (700 pgs., \$350) Choin Store Guide 425 Park Ave. New York, NY 10022 (212) 371-9400

CIRCLE 697 ON READER SERVICE CARD

Directory of Mailing List Programs

A directory reviewing 36 mailing list programs that can run on the user's system. Two charts compare over 90 criteria, under such categories as Basic Information, System Environment, Input (creating files and adding, changing, or deleting data), Processing, and Output (label printing). Included is a list of the software firms and their addresses. (List Price: \$6.50) System 33 P.O. Box 25395 Los Angeles, CA 90025 (213) 826-5840

CIRCLE 699 ON READER SERVICE CARD

COLLEGIATE MICROCOMPUTER

A quarterly journal for the exchange of ideas on the role and uses of the microcomputer in all subjects and areas of college and university life. Material appearing includes the uses of hardware and software in curricula, descriptions of courses using personal computers as tools, results of research and experiments using personal computers, student projects, suggestions and tips on incorporating personal computers into the classroom, etc. (Subscription Rates: \$28 per year U.S.; \$36 per year outside U.S.) COLLEGIATE MICROCOMPUTER Rose-Hulman Institute of Technology Terre Haute, IN 47803 (812) 877-1511

CIRCLE 702 ON READER SERVICE CARD

PC/XT Product Directory

A directory of over 3000 products, including hardware, software, accessories, and books. The directory contains an alphabetical listing of each vendor with address, a description of each product offered, its requirements, and price.

In addition to the product listings, the directory contains charts and tables



dBASE II Techniques Manual, Compuserp Corp.

comparing both hardware and software in a number of categories. The directory's index lists entries by product category, product name, and product type. A glossary of terms and acronyms has also been included.

The directory is available in either printed or diskette form. (List Price: Either form \$11; both forms together \$20)

Computer Information Collective P.O. Box 10996 #363 Austin, TX 78766

CIRCLE 696 ON READER SERVICE CARD

dBASE II Techniques Manual

A manual providing techniques and command files for effective operation of dBASE II software. The Compuserp Beginning and Advanced dBASE II Techniques Manual features complete command files, a

journal entry sub-system, and instructional techniques for saving disk end directory space, speeding up data processing, using ASCII characters, using the CP/M editor, and increasing overall efficiency.

The 96-page manual lists methods for combining command and form files and using dBASE II instead of such functions as the CP/M PIP. Command files include instructions for establishing a notepad system, days of week, metric conversion tables, and other programs, offered along with the journal entry sub-system. (\$25)

Compuserp Corp. P.O. Box 147-S Natick, MA 01760 (617) 235-5152

CIRCLE 704 ON READER SERVICE CARD

New On The Market

Interfacing to Microprocessors

A guide to the design, arrangement, and programming of microcomputer interfaces. This book, by J.C. Cleley, examines the development and testing of systems, as opposed to isolated circuits, and includes design examples and solutions to problems. Program examples illustrate how data transfer can be effected, how the state of external devices can be tested, and how they can be controlled.

The guide covers such topics as basic microprocessor architecture as it relates to interfacing techniques, the principles of data transfer, I/O packages, buses, transducers and signal conversion techniques, and system testing and development. Discussion is given to such subjects as flag testing, digital inputs, analog sensors, nonlinear operations, output and motor drive circuits, logic state analyzers, graphical displays, direct memory access, and in-circuit emulators.

A chapter is devoted to 16-bit microprocessors, including the Intel 8086, the Motorola 68000, and the Zilog Z8000. (157 pgs.; \$24.50) McGraw-Hill Book Co. Professional & General Books
1221 Ave. of the Americas
New York, NY 10020
(212) 997-3493

CIRCLE 766 ON READER SERVICE CARD

Press Release of the Month

Dada Data Corporation today announced the introduction of its new Widgit/666, an advanced new office automation product that runs on electricity.

With a state-of-the-art design that stresses full functionality and versatility, the new Widgit/666 solves the problem of the bureaucrat who needs to exhaust his capital expenditures budget by the end of the fiscal quarter.

"Buy this product and I'll be your friend," said George Metesky, Dada Data's marketing vice-president, who insists on being quoted in press releases. "At Dada Data, we understand your problems. After all, we're bureaucrats, just like you."

Fully Compatible: The new Widgit/666 is fully compatible with the rest of the Dada Data product line. The color is the same, the finish is the same, the logo is the same. Seen alongside other Dada Data equipment in a data processing shop, no one will question it.

User Friendly: The new Widgit is easy to use. There is no puzzling keyboard and no intimidating dials, buttons, light panels, or controls of any kind. A simple yet stylish chromium on/off switch (a component operating with binary logic) provides a streamlined user interface to the system.

When used with Dada Data's GonzoNet local-network architecture, the Wid-

git can be fully ignored from any of the network's member processors. The Widgit can be activated, deactivated, installed, removed, or pushed out of an airplane without affecting the operation of the network as a whole—and vice versa.

Software Support: The Widgit/666 may be unique in the world of data processing in that it requires no software of any kind. A full range of documentation is, nevertheless, provided with the unit, including a thick notebook of highly technical yet ultimately meaningless performance data, which should provide the end user with everything he needs to justify his purchase.

Ergonomic Design: The Widgit/666 features "ergonomics," a marketing buzzword that implies that a system is designed to be used by human beings. The use of human-factors engineering in the Widgit's design is in stark contrast to most equipment produced by the DP industry, which is apparently intended for dogs, rats, salmon, and kangaroos.

Communications Capabilities: The user need not bother with standard communications protocols, such as asynch, hisynch, RS-232, X.25, SNA, or TTY, since the unit has no communications capabilities of any kind.

Though the Widgit/666 is designed for the electronic office, it will not interfere with normal business conversations, since it produces

none of the distracting noises associated with computer equipment. Additionally, the top of the unit offers a flat, firm surface on which a standard telephone may be positioned; with this peripheral device, the Widgit/666 system will support voice communications to nearly any place on earth.

Simple to Operate: After plugging in the Widgit/666, the operator merely has to flip the little chromium switch on the right-hand side of the unit to fully boot up the system (as an option, the Widgit may be delivered with the switch installed on the left). A small, red indicator lamp will then come on, radiating a cheery glow into the otherwise bleak computer room. If the Widgit is not being used for communications support (as described above), the system operator may place a coffee pot on top of the unit and attach it to the two-prong port on the interface panel at the rear of the chassis.

Other uses of the versatile Dada Data Widgit/666 are only limited by the user's imagination—though in the data processing profession, this may be a grim statement.

Dada Data Corporation develops, manufactures, markets, and supports whatever sells. For details, call up and find someone willing to talk to you. **List Price:** Widgit/666 \$599, left-handed model \$619, coffee pot \$32.75, coffee \$5/bag.

—Lamont Wood

TOTAL RECALL™

THE DATA BASE FOR SOPHISTICATED LIST MANAGEMENT APPLICATIONS

TOTAL RECALL - power and sophistication in list management for both the novice user (everything's in 'English') and the computer whiz (extremely flexible).

Simple to understand, fast to learn, and exceptionally easy to use.

You can have this fast and highly efficient program running in less than one hour.

- For customer lists, patient lists, keeping track of prospects (first time called, number of children, etc.), organizing mailing lists to take advantage of Post Office discounts, and many other uses.
- Easy to Understand and Use - IBM® style manual filled with examples and complete 'English' language instructions.
- Complete 'For the Novice' Tutorial.
- Flexible Structure - with TOTAL RECALL you define your own entry format with up to 15 fields, 35 characters per field, plus numeric and date fields.
- Sophisticated List Management - You can extract entries from your list using up to 15 different parameters then sort your list up to 3 levels deep.
- Completely Menu Driven - no special codes to learn, no 'computerese' to wade through.
- Design your own Mailing Labels using your own date plus an optional message line. Prints 1, 2, 3, and 4 across labels.
- Especially easy to use with IBM Fixed Disk and other hard disks. All programs and data can be on the hard disk.
- Automatic totalling on numeric fields.
- Wordstar®-MailMerge®, PeachText®, and other word processors compatible for form letters and custom reports.
- Conversion facility for your existing files.
- DOS 1.1 and 2.0 compatible. Uses standard DOS files. Up to 100,000 records per file using DOS 2.0.
- IBM PC®, PC-XT®, Columbia®, Compaq® and other popular MS DOS machines.
- **\$129.95** Now at ComputerLand and other fine stores



CUSTOM MAILING LABELS



FILE DEFINITION



FAST SELECTION/SORT

ANNOUNCING THE ADDITION OF NEW SOLUTION-ORIENTED SOFTWARE

Sophisticated application software for 16 and 32 bit microcomputers

Packages For:

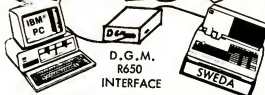
- Manufacturing Control (MRP)
- Property Management
- The Legal Profession

SOFTA PUBLISHING

A Division of The SOFTA Group, Inc. Formerly PCLE Business Software

The SOFTA Group, Inc.
778 Frontage Road Suite 106
Northfield, IL 60093
312/446-SOFT

CIRCLE 360 ON READER SERVICE CARD



CONNECT YOUR IBM PERSONAL COMPUTER
TO YOUR SWEDA L-50 CASH REGISTERS!

The D.G.M. R650 Interface hardware
and software will make this connection.

- 5 1/4" Diskette with Handler and Sample File \$ 99.00
- Sweda F1 IRC Board \$ 295.00
- Sweda to D.G.M. 50 ft. Cable \$ 35.00
(Add 25¢/ft. when ordering Long Cables)
- D.G.M. to IBM 10 ft. Cable \$ 35.00
- R650 Interface (1 to 31 L-50s) \$1425.00

Order Now:

D.G.M. Corporation, 7671 Central Ave. NE,
Minneapolis, MN 55432 (612) 784-7499

*IBM is a trademark of Int'l Business Machines

*Sweda is a trademark of Sweda Int'l Inc.

CIRCLE 201 ON READER SERVICE CARD

COMPUTER COZIES?



Custom-Made, Quilted Computer Covers

Anti-static, machine washable. Offered in 6 colors: grey, cream, chocolate, navy, burgundy, or rust. Any cover can be made-to-order — just send dimensions. Perfect Christmas gift — order one for your VCR or Betamax. System and Monitor (1 or 2 piece) and keyboard: \$50/set. Narrow printer: \$20. Wide printer: \$24. Individual unit prices available. Specify system and printer model #. CA residents add 6.5% sales tax. Please allow 6-8 weeks for delivery. VISA/MC accepted.

COVERS A LOT

P.O. Box 369, La Honda, CA 94020 (415) 747-0352

Now For IBM PC!

**MCBA Mini-Computer
Software For
Distributors and Manufacturers**

—A FULLY INTEGRATED
ACCOUNTING AND DISTRIBUTION
MANAGEMENT SYSTEM

- RM COBOL
- SOURCE CODE AVAILABLE
- FIELD TESTED — 8 YRS.
- UP TO 9 INTERACTIVE MODULES
- G/L, A/R, A/P, PR, I/M, C.O.P., P/O
B.O.M.P., J/C
- Dealerships and Consultant Arrangements
Available



**Macola,
Incorporated**

181 S. Main Street
(614) 382-5991
Marion, Ohio 43302

MCBA is a Registered Trademark of
Mini-Computer/Business Applications

CIRCLE 263 ON READER SERVICE CARD

PSYCHE SAYS IT ALL

NOW YOUR PC WILL TALK BACK TO YOU
FINALLY A REALLY NEW MODERN ARTIFICIAL
INTELLIGENCE PROGRAM. Written especially to capitalize on
the speed and power of the IBM PC. PSYCHE will hold a
delightfully real keyboard conversation with you on 60 subjects,
including marriage, work and sex. PSYCHE's responses are so on
target you will find yourself thinking of PSYCHE as an actual
person.

Unlike the early efforts of the 1980's, PSYCHE incorporates
sophisticated new grammar algorithms, adaptive subject
tracking, pronoun identification and an enormous vocabulary.
PSYCHE knows 1000 psychologically significant words and
draws on a repertoire of over 500 responses, with program end
files totaling more than 150K bytes.

And you can customize PSYCHE easily. Powerful menu driven
routines let you create imaginative new vocabularies and
responses.

Show off your computer. PSYCHE won't embarrass you with
bad grammar and off-the-wall combacks. PSYCHE will even
greet your friends by name.

Psychologically valid responses qualify PSYCHE as a Rogerian
Counseling teaching aid. Educational as well as lots of fun. Seven
page manual included.

PSYCHE \$50.00

SECRETS WON'T TALK

DO YOU SHARE YOUR PC?

SECRETS will keep your personal letters, diary, new program, or
first novel top secret. SECRETS is a file encoding program that
will quickly code any text file (up to 51,000 bytes) in one or more
of 10,000 codes so no one but you can read it. Efficient coding
holds the code file to the same size as the original. Works with
word processor, BASIC or any text files.

SECRETS \$50.00

BOTH REQ. DOS 1.1 64K, 2.0 96K, DISK, 80 CHAR DISPLAY

PHONE OR MAIL. VISA, MASTERCARD OR CHECK
Shipping & Handling \$2. Florida residents add 6% tax.

***** (305) 391-4610 *****

Copyright 1983 BALIS COMPUTING, INC.
PO Box 273261, Boca Raton, FL 33427

CIRCLE 140 ON READER SERVICE CARD

CHRISTMAS SHOPPING LIST

CALL US FOR SPECIAL CHRISTMAS PRICES

PRINTERS

Duilio 630R155	\$1095
Epson FX80	560
FX100 w/tractor	690
C 10th Printer II Par	SCALL
Starwiter F10	1450
Printmaster F10	1450
NEC 3550 Spinwriter	1750
Okidata - all models	SCALL
Toshiba P1350	1595

HARD DISKS

Davong, External w/power supply	5, 10, 15, 21, 32MB	from 1525
---------------------------------	---------------------	-----------

MONITORS

Amdex Video 310, amber/green	SCALL
Color II RGB w/cable	419
PGS HK-12 w/cable	SCALL

MODEMS

Hayes Smartmodem 300 Baud	SCALL
1200 Baud	SCALL
1200B w/Smartcom II	SCALL

EXPANSION BOARDS

AST SixPakPlus	SCALL
Seattle Computer RAM + 3	265
Quadram's Quadboard, 64K	269

STOCKING STUFFERS

Lemon, Lime, Orange Surge Protectors	
Keytronic keyboard	SCALL
Quadrax, "An apple on a board"	495
Ashlon-Tate Dbase II, 2.4 format	SCALL
Verbatim diskettes, 10 ea 5 1/4"	
Single-sided, double-deck	25
Double-sided, double-deck	35
Maynard SandStar Series	SCALL

FOR PRICE QUOTE OR TO ORDER **CALL (714) 546-7481**

CALL FOR INFORMATION ON OUR COMPLETE PRODUCT LINE
LOW DISCOUNT PRICES • FULL FACTORY WARRANTY
FAST, PERSONALIZED SERVICE



DONELL COMPUTER PRODUCTS

3261 Michigan Ave., Costa Mesa, CA 92626

No charge for MasterCard or Visa. In stock items shipped within 24 hours. Prices and products subject to change without notice.



CIRCLE 209 ON READER SERVICE CARD

Chocolate



Eat-only Diskettes

Here's the ultimate high-tech gift... two 5 1/4" Diskettes, artfully crafted from luscious milk chocolate - and who can resist chocolate? Eat-only Diskettes come in a handsome gift box - perfect for friends, family, or business, on any occasion.

1/2 pound of chocolate. Guaranteed "User-Delicious!"

Quantity discounts available. We receive long and high-tech products in chocolate - call (802) 662-8888 for info.

\$12.95 postpaid

Check (payable to: Sweetware, Inc.)
Visa or MasterCard (include card # and exp. date) to SWEETWARE, 516 Shelburne Rd., So. Burlington, VT 05401

For Fast Service
Credit Card orders only
(802) 658-7800



We make high-tech appetizing!

CIRCLE 395 ON READER SERVICE CARD

WATSOFTPRODUCTS INC.

A subsidiary of the University of Waterloo

Announces

Waterloo NetWorkStation Tools

for the IBM Personal Computer

Editor

- full-screen
- colour support
- function keys

Host Communications

- VM/370 CMS, RST/E, VMS/VMS
- file transfer micro to/from host
- access host files from micro programs

Terminal Emulation

For further information contact:

WATSOFT Products Inc. (519) 886-3700
158 University Ave. W. Telex No. 06-955458
Waterloo, Ontario
N2L 3E9

CIRCLE 473 ON READER SERVICE CARD

PROTECT & ORGANIZE your IBM PC with COMPUTER ESCORT™



The **COMPUTER ESCORT** is custom designed with optimum quality and utility offering features such as:

- Secures the IBM PC, via a detachable adapter plate, to the low profile lower shelf unit which is secured to your table top via a separate detachable adapter plate.
- Keyboard storage behind locked front panel with optional sliding keyboard shelf.
- Optional **POWER SENTRY** provides control of 4 a.c. outlets with a keylock switch. All 4 outlets offer your computer and peripherals protection with a state-of-the-art transient suppressor and fuse.
- Rear cover hides excess cables stored in the rear chamber and restricts access to the a.c. outlets when the **POWER SENTRY** or other power strip is used.
- Optional top shelf unit secures your monitor directly or via an optional ball bearing swivel adapter plate.
- Precision heavy duty welded steel construction throat is enhanced with textured enamel finish color matched to the IBM PC.
- Designed for easy end user installation saving you both time and money.

APPLE II OWNERS - SEE THE NEW COOL STACK™ - SENTRY II.

IBM is a trademark of International Business Machines Co. **COMPUTER ESCORT** and **COOL STACK** are trademarks of FMJ INC. Patents Pending.

For more information on these and other fine FMJ products, see your dealer or FMJ, Inc., P.O. Box 5281, Torrance, CA 90501 (213) 325-1900. DEALER INQUIRIES INVITED.

CIRCLE 532 ON READER SERVICE CARD

SDA

WHAT IS IT?

The premium SCREEN DESIGNER for the BASIC LANGUAGE on the IBMPC. As much as 50% of programming development effort is spent in coding screen displays. Think about it. 50% of your time... Time is money. SDA gives the BASIC language programmer a very fast, very powerful, easy to use tool that automates screen construction programming. With one tool, create and maintain, sophisticated, professional quality, protected format, fully documented screen displays normally found on larger computers.

WHAT IT DOES

Up to 100, fixed length, fields
Forward/backward TABING
Automatic field advance
FIELD EDIT, Transpose right alpha
Automatic field integrity
Insert, delete, destructive back space,
cursor right or cursor left in any field
4,1,1,1,1,1 NUMERIC EDITING
DATA TRANSFER to/from program by
complete record, not field
RECOVER DATA lost by overwrite

Eliminates field overrun
Automatic DATE/TIME option
Numeric validation, zero fill, rht, ord,
numeric
Eliminates "red from start"
Any combination of normal, high intensi-
fity, reverse or blinking VIDEO charac-
ter display
No cursor movement out of fields
Unassigned use of FUNCTION KEYS
REQUIRED FIELD ENTRY option
and MORE

HOW IS IT USED?

SDA is a SCREEN PAINTER, simply key descriptions, labels or Y anywhere on the screen, define your fields and SDA does the rest. It's that easy.
Automatic line centering
Move entire lines right or left
Fields easy to delete, review

HOW DOES IT INTERFACE?

SDA creates BASIC, version 1.1, code, or ASCII format, in easily MERGED or compiled into any program, or "CHAIN"ed into diskette. The code for each screen is fully contained in a subroutine.

WHERE TO GET SDA?

SDA is available only from
AUE COMPUTER ENTERPRISES

P.O. Box 8378
Concord, Calif. 94534

PH: (415) 228-3537

Software is provided on 5 1/4" diskette with full user documentation. Price... \$149.50 (plus shipping) California residents include 8 1/2% sales tax.
We accept checks (10 days to clear), money orders, VISA or MASTER CHARGE.

CIRCLE 104 ON READER SERVICE CARD

PC LOGO IS HERE!

- PC LOGO features include:
- Program and Utility Disks
 - Runs on IBM DOS
 - Complete Tutorial and Reference Manuals
 - Full peripheral communication capability
 - 64K expandable to 128K
 - Function keys defined
 - \$199.95 complete

To order PC LOGO, contact:
Harvard Associates, Inc.
260 Beacon Street
Somerville, MA 02143
(617) 492-2999
(Dealer Inquiries Welcome)



The Logo language for the IBMPC™ is here. PC LOGO is a full implementation of Logo including word and list capability as well as turtle graphics. Since PC LOGO incorporates much of the syntax of Logos available on other computers, it is easy to learn. PC LOGO goes far beyond other versions of Logo by taking advantage of the extra features of the IBM PC including function and arrow keys and provides a greatly enhanced editor.

IBMPC is a registered trademark of IBM Corp.

CIRCLE 224 ON READER SERVICE CARD

FREE WORD
PROCESSOR

SearchLit

YOUR KEY TO KEEPING UP
WITH THAT RAPIDLY EXPANDING
LITERATURE IN YOUR PROFESSION

SearchLit is a ready-to-use program for your IBM-PC which stores and searches information related to your own personal literature collection. Each reference, including abstract or your comment, is stored under a set of key words. Retrieval is based on the key words in title, abstract or special key word file. Mention this ad in your purchase order and we will send you a free copy of MediScript I, a multifunction word processor ideal for letters and short to medium length essays. Needs 92K, DOS 1.1.

SearchLit \$149.50



MediSoft

Medical Professions Building
1595 Soquel Drive, Suite 350
Santa Cruz, CA 95065

In Calif. add 6% sales tax (Shipping and Handling included in purchase price). 30 days satisfaction guaranteed or your money back (minus \$4.00 Shipping and Handling).

CIRCLE 296 ON READER SERVICE CARD

\$\$ WE WILL NOT BE UNDERSOLD \$\$

EPSON

RX 80, MX 80 FT, ILX, MX 100, FX 80
and newest FX 100 "lowest prices in USA"

PRINTERS

C. Itoh 8510 Prowriter (P) \$385.00
C. Itoh 1550 Prowriter (P) 679.00
Gems 10X 329.00
Gems 15 499.00
Okidata 82A 419.00
Okidata 83A 649.00
Okidata 92 520.00
Okidata 93 869.00
Smith Corona TPI 549.00
Brother HR 1 CALL
Brother HR 15 CALL

MODEMS

Hayes 300 B 209.00
Hayes Smartmodem 300/1200 485.00
Hayes Smartmodem 1200 B 479.00
Hayes Smartmodem 114.50
Com'soft

DRIVES

Tandon T80 1800 0500 \$284.50
Tandon TM50-2 slim 0500 .298.50
Teac 5 1/4" F0 55 0500 .298.50

MEMORY I/O BOARDS

AST Megaplug 64K (c.d) 337.95
AST Megaplug 64K (c2-g) 378.95
AST Megaplug 64K (c.s.d) 378.95
AST Megapac (256K-512K) 638.95
Combo Plus (c2-s1-p) 314.95
I/O Plus (c2-s1-p) 294.50
ALL OTHER CARDS AVAILABLE CALL

SOFTWARE SPECIALS

Lotus 1.23 350.00
Multiplan 175.00

DISKETTES

Elephant 0500 28.50
Microsoft Mouse CALL

3% Charge Cards, 3% ship. Prices subject to change.

A COMPUTER SHOP

Dept. 345, 3941 B South Bristol St. Santa Ana, CA 92704
(Outside CA) (800) 824-2227 Orders Only
(714) 261-1383 Technical Information

CIRCLE 190 ON READER SERVICE CARD

**SPECIAL WHOLESALE
MAIL ORDER PRICES**

**SCOTCH
DISKETTES
\$20.95
PER 10-PACK
(5 Box Minimum
Purchase)
5 1/4" Single Sided,
Single Density**



**\$19.95
SCOTCH HEAD
CLEANING KITS
5 1/4" & 8" KITS**

**SCOTCH
DISKETTES
\$22.50
(1 Box Purchase)
5 1/4" Single Sided,
Single Density
(\$49.95 VALUE)**

**LIMITED TIME OFFER
FREE CREDIT CARD CALCULATOR
(With Purchase of any 5 — 10 Pack Boxes)**

- Hard Storage Boxes
- Pull Tabs & Labels
- Individual Envelopes
- Lowest Wholesale Prices in the Industry
- Lifetime Warranty on Workmanship of Diskettes

Single-Day Processing on Most Orders

**CALL ABOUT OUR FULL LINE OF WORD PROCESSING
EQUIPMENT, INCLUDING MINI CASSETTES,
COMPUTER TAPE, DISK PACKS, STATIC MATS, ETC.**

DISKETTE JUNCTION

5918 SMITH ROAD • CLEVELAND, OHIO 44142
OHIO RESIDENTS (216) 676-5640 TOLL FREE (800) 321-5134
Visa • MasterCard • Checks • Money Orders • C.O.D.
[Plus Handling]

CIRCLE 102 ON READER SERVICE CARD

The Statistician



- Multiple Regression
- Stepwise Ridge
- All Subsets
- Backward Elimination
- Time Series Analysis
- Descriptive Statistics
- Transformations
- Survey Research
- Nonparametrics
- XY Plots
- ANOVA
- Random Samples
- Data Base
- Search & Sort
- Hypothesis tests



Quant Systems

**Please call TOLL FREE
1-800-334-0854 (Ext. 814)**

for more information or write:
Quant Systems
Box 628
Charleston, SC 29402
(803) 571-2825
VISA/MC Accepted

CIRCLE 112 ON READER SERVICE CARD

PC Tech

**BUSINESS & HOME COMPUTERS
Products Sales & Services**

**We Shop The Wholesale Market And Negotiate The Best Price For You
We Save You Off The List Price. We Share A Common Goal - To Save You Money.**

**IBM PC Compatible System
Includes 640 Memory
W 220KS Disk Dr. & Controller,
Color Graph. Card, Monitor,
Only \$2595.00**

***Compaq 128K Desk Unit
Complete System \$2995.00**

**IBM PC Compatible Drives
Super 5.1/80 H-H \$249.00**

Super 5.1/80 H-H \$229.00

Compaq Disk Sys. 6 MB \$1339.00

Compaq Disk Sys. 11 MB \$1339.00

Compaq Disk Sys. 20 MB \$2899.00

***AST COMBO Card
*Combs Plus-Pack Planner &
Serial Port Clock Calendar
W Battery Back Up W Super
Spooler Super Drive \$499.00**

***Mega Plus-Pack Planner & Serial
Port Clock Calendar W Battery
Back Up W Super Spooler Super
Drive \$499.00**

***QUADRAM
*Quadram call for best price**

***Quad 512 & 84K \$349.00**

***Quadboard 64K \$319.00**

***Quadboard 128K \$199.00**

***MAYTRON ELECTRONICS
FDDY Disk Controller \$169.00**

FDDY W Parallel Port \$219.00

FDDY W Serial Port \$229.00

**Memory Card W 256K
RAM \$499.00**

**NEC APC 8800 Systems
call for best price**

***PRINTERS
*NEC
8202A \$395.00**

3200 Splitter \$1339.00

3010 \$1370.00

7710-1 \$1995.00

2050 \$1719.00

2010 \$795.00

2050 \$810.00

***BROTHER D-W
HR-14 P \$739.00**

HR-14 S \$639.00

HR-15 \$829.00

Tractor \$129.00

***OKidata
Okidata 824 120 CFS \$415.00**

Okidata 824 120 CFS \$455.00

Okidata 840 200 CFS \$550.00

Okidata 840 200 CFS \$595.00

Okidata SP 180 CFS \$899.00

***ODEMI
Garnet 10 \$325.00**

Garnet 15 \$345.00

Garnet 15 \$495.00

Super S-CPU \$339.00

**Business Software
Software Discounters
Purchase On Line. Underhand
ware**

**Apple IIe 64K System
Disk Drive W Controller
Monitor W Stand \$899.00**

**Apple IIe Compatible 64K
Compatible Drive Controller
& Monitor \$299.00**

**Mac Drive 100% Apple
Compatible W Case \$219.00**

**Cable (Replaces Next)
Controller Card \$49.00**

16K Memory Card \$39.00

280 Card \$109.00

80 Column Card \$115.00

***MOWTORIS
BMC IM 12 AU 12" G \$89.00**

BMC IM 12 AU 12" A \$99.00

BMC IM 1401768 W G \$2 \$399.00

DYNAC 120 GM \$139.00

DYNAC AM 121 AM \$169.00

TAXAN KC-12MG \$329.00

TAXAN KC-12MA \$199.00

TAXAN RGT1 \$339.00

AMODEX 12" G #300 \$159.00

AMODEX 12" A #300 \$159.00

***WOODEN
Smartboard 1200 \$499.00**

Smartboard 1200B \$479.00

Microboard 8 \$279.00

Microboard 8 1/2 \$299.00

PROFESSIONAL SOFTWARE FOR MICRO'S



- Insurance Agency Management
- Medical Office Management
- Dental Office Management
- Property Management
- Legal Time Accounting
- Professional Time Accounting



**On-Line Order Entry
Super Ledger Accounting
General Ledger Accounting
Accounts Receivable
Accounts Payable**



**Data Base
Management**

Runs On CP/M, CP/M-86 & MS-DOS

**UNIVAIR
SYSTEMS**

**UNIVAIR INTERNATIONAL
1024 ST. CHARLES ROCK ROAD
ST. LOUIS, MISSOURI U.S.A. 63114**

(314) 426-1099

**Dealers
Welcome**

PC Tech (714) 546-3887 3742 W. Warner Ave., Santa Ana, CA 92704
Disc Drive Service Available At Low Cost-Quick Turn-around

ADD SHIPPING CHARGES Telephone or Mail Orders Please Cashier's Checks, Money Orders
Check Amount 10 days CDD Accepted CA Residents Add Tax Prices Subject to Change Without Notice

CIRCLE 503 ON READER SERVICE CARD

**MS-DOS is a registered trademark of Microsoft
CP/M & CP/M-86 are registered trademarks of Digital Research**

CIRCLE 596 ON READER SERVICE CARD

Learn how to grapple with GRAPHICS, handle mounds of memory, and quiet down a printer in this month's session with the PC Tutor.

PC Tutor



Graphic Jam

Q: Could you explain how the PC-DOS 2.0 GRAPHICS command works? The manual says that it can be used to print text-mode screens, but when I do that I get the same output I'd get if I simply used the PrtSc key without the GRAPHICS command. Also, I find that I don't get a good copy of the screen. For example, I made a double-line box, but when I printed the screen, it came out as a single-line box. Is the IBM printer not thoroughly compatible with the PC screen?

One last question. If I use BASIC to create a screen, how can I return to DOS to issue a GRAPHICS command without messing up the screen?

Michael Trombetta
Manhasset, New York

A: The first thing to keep in mind is that GRAPHICS is a program. Once you run it, by typing GRAPHICS, it loads itself into memory and stays there, despite the absence of any sign-on or informative message. Once loaded, GRAPHICS knows when you are in graphics mode and will dump the screen accordingly when you hold down the shift key and hit the PrtSc key.

This will work from within BASIC and most other languages. You don't need to exit to DOS; just hit the PrtSc key. If the machine is rebooted, you will need to

reload GRAPHICS.

If you are in character mode, however, GRAPHICS just lies passive and lets the IBM's normal print screen function go to work. This is why characters you use from the upper 128 set display incorrectly. Most printers only print 96 characters, and there is no standard for the full set of 256 characters.

The Silent Type

Q: I want to use a thermal printer with my IBM PC, but my local computer store tells me they know of no such product.

I know that a thermal printer's output would not be letter-quality and that in time the printout would fade. Neither of these limitations matter to me; I simply want the peace and quiet. Can you suggest a solution?

Carl Diessen
Frederick, Maryland

A: I have not found a thermal printer (not a terminal) suitable for the PC. You might consider three other options for quiet printing, however.

First, you might try some of the newer dot-matrix printers. Both the Epson FX-80 and the Okidoto 9X series run quite comfortably. When you run it in normal speed mode, the FX-80 can't be heard through apartment walls. The FX-80 also has a half-speed quiet mode, but this actually seems a bit noisier.

ONCE
you run GRAPHICS, it
loads itself into memory
and stays there.

If the noise of even these new dot-matrix printers annoys you, try making a muffled box for your printer. Make it look like a very deep bookcase. Use strong pieces of 3/4-inch wood, join them with screws and/or a sturdy wood glue, then line the box with a lint-free carpet fragment, such as a kitchen carpet, or a heavy material such as fur drops.

Remember to leave a slit in the box so the paper can be fed in. The box will act like a muted speaker, so point it at a non-reflective surface. In terms of sound

INK JET printers work by actually shooting ink at the paper.

reflection, the worst (most reflection) to best materials are glass, steel, tile, glazed brick, glossy point, flat point, wood, large oil paintings, furniture, and drapes.

Sometimes, pointing the printer and its box in the right direction will reduce noise adequately.

Another option is to purchase a noise shield. A number of letter-quality printers have plexiglass shields available that cut the noise down considerably. They work best with a sheet feeder or roll paper. A strong base is important to reduce transmitted vibration.

The most attractive option might be to purchase an ink-jet printer. There is at least one available now that produces excellent copy with essentially no noise, the Olivetti PR 2300 at a price of \$560. It might sacrifice speed for silence, but you say that is no problem.

Ink jet printers work by actually shooting ink at the paper. Although early ink jets were plagued by drying ink and clumps (the same problems that attack fountain pens), later versions use some interesting approaches. The PR 2300 uses an electrostatic method with a solid ink.

Inline Assembly

Q: I find working with the Assemble (A) command in the PC-DOS 2.0 DEBUG a useful way to learn more about assembly language programming without going through the entire compile sequence using the macroassembler.

When using EDLIN, ASM, and LINK, I can express a segment override as follows:

```
MOV ES:[BX],AX
```

I find that the compile process converts this to the following when I look at the unassembled program in DEBUG:

```
SEG ES  
MOV [BX],AX
```

My question is, how can I accomplish this using the inline assemble in DEBUG? It will not accept either of these

formulations on input.

Elmer Schwittek
Atlanta, Florida

A: Although the DEBUG software for PC-DOS versions 1.1 and 1.0 suffered horribly from incompatibility between the assembler and the debugger, the PC-DOS 2.0 version is much improved. In general, it shows the some mnemonics as ASM has compiled.

Apparently, the inline Assemble (A) command suffers a bit from that problem as well. My inline Unassemble (U) command actually shows

```
ES:
```

```
MOV [BX],AX
```

as a segment descriptor, so you need to enter ES: (I wonder, though, if we have different versions of DEBUG? Mine has a time stamp of 3-08-83.)

Compiled Gibberish

Q: There are many times that I find a bug in the software that I would like to correct. PC-DOS will give me a listing of programs328 that are in BASIC, but when I request a listing of a program in any other language, I get gibberish. Is there some

IF YOU
save a BASIC program,
you normally get
something unreadable
by PC-DOS.

command or method that I can use to get a listing in the original language, or even in hexadecimal code?

Harold Paz
West Covina, California

A: Most programs that you might try to list are written in a compiled language, such as Pascal or compiled BASIC. As a result, the file contains object code in machine language, which consists of a string of numbers intelligible only to the 8088 processor, not a listing of the program.

Note that if you save a BASIC program, you normally get something unreadable by PC-DOS. To get a listable version, use the A option by keying in something like SAVE "MYPROG".A. The file named

!!!!COMPETITIVE PRICES!!!! FROM DIGITAL DIMENSIONS

FULL 5TB LINE OF MULTIFUNCTION BOARDS	CALL
FULL QUADRAM LINE SUPPORTS MONITORS, EXPANSION BOARDS, ETC	CALL
64K UPGRADE KITS	\$58

PRINTERS

OKIDATA ML80	\$295
ML82A	\$365
ML83A	\$365
ML84P	\$365
ML84S	\$1065
ML82P	\$435
ML83P	\$725
PACEMARK-2350P	\$2015
PACEMARK-2350S	\$2135
PACEMARK-2410P	\$2305
PACEMARK-2410S	\$2405

C. ITOH 8510-AP	\$395
8510-BCD	\$575
1550-P	\$665
1550-BCD	\$745
STARWRITER F-10	\$1145
PRINTMASTER F-10	\$1485
8600 BP	\$1055
8600 BR	\$1115

GORILLA BANANA	\$199
IDS PRISM 80 W COLOR	\$1421
PRISM 132 W COLOR	\$1591

DIABLO 620	\$965
630-R-155	\$1875
630-KSR	\$2585

DAISYWRITER 2000	\$1035
QUIME 1140+	\$1390

RITEMAN INFORUNNER	\$349
TRANSTAR T315	\$477

SILVER-REED EXP 550 P	\$655
EXP 550 S	\$685
EXP 500 P	\$425
EXP 500 S	\$465

NEC 3550	\$1915
3510	\$1565
8023 A	\$705

GEMINI 10X	CALL
15X	CALL

MODEMS

HAYES 300 SMARTMODEM	\$219
1200 SMARTMODEM	\$509
1200B SMARTMODEM	\$459
MICROMODEM II	\$309

MONITORS

AMDEK COLOR I	\$295
COLOR II PLUS	\$435
COLOR II	\$432
300 A	\$152
310 A	\$172

NEC JB1260	\$110
GORILLA	\$95

TAXAN RGB I	\$309
RGB III	\$489
GREEN PHOSPHOR	\$127
AMBER	\$137

QUAD CHROME	\$502
QUAD SCREEN	\$1495

DIGITAL DIMENSIONS

Suite 123
375 Hartford Trpk., Vernon, CT 06066
Info & Orders Call 203-872-8569
Orders Only 1-800-243-5222

All Prices Include UPS Ground Freight in U.S.
CT Residents Add 6% Sales Tax
Prices Subject To Change Without Notice

CIRCLE 446 ON READER SERVICE CARD

THE CHURCH

Information Management System



Your Software Guardian™

ADAM II™

MODULES

- 1 Membership Module
- 2 Stewardship Module
- 3 Communications and Cataloging Module
- 4 Spiritual Growth Module
- 5 Outreach Module
- 6 Church Discovery Module

Demo Packages
available for
Modules 1, 2, 3

written in...
dbase II™
8 and 16 BIT, CP/M compatible

*Digital Research Inc.,
*Software 1985

**DEALER INQUIRIES
WELCOME**

1-800-ADAM 222
(1-800-232-6222)

ΩMEGA User Lovin'
Information Systems Software™

P.O. Box 450125
Atlanta, Georgia 30345
(404) 329-0091

Your Software Guardian, ADAM II &
User Lovin' Software are trademarks of
Omega Information Systems

MYPROG.BAS will contain the listing of your program. You can use a text editor to edit this program file, then reload it with BASIC at any time.

As for listing object code, the best approach is to use the DEBUG program. Try the following. First, put the PC-DOS disk in drive A. Then key in the following

FOR LISTING
object code, the best
approach is to use the
DEBUG program.

in response to the PC-DOS and DEBUG prompts:

```
A>DEBUG DEBUG.COM
-U
```

You will see the DEBUG.COM program in a form as close to source code as you can get. What you'll see is assembly code, with actual numbers and addresses rather than the labels (variable names) that are normally used. If you want to see the program in HEX, key in the D100 command rather than U in response to the DEBUG prompt.

A Surfeit of Memory

Q: With a small fortune in software and hardware in my office end home, I still seem to be having difficulty.

First, I decided that 576K was not enough, so I repopulated the memory to 832K. Now my JFORMAT program, from Tell Tree Systems, cold boots with a screen full of multi-colored garbage. Tell Tree Systems told me my mistake is that I did not purchase its RAM cards. Tell Tree cards, I was told, do not have these problems. Can you tell me why?

Then I decided to purchase some QCS Winchester drives. After acquiring the hard disks, I found I couldn't install my most expensive, copy-protected software. Nor can I use the RAM manager, spooler, and Winchesters at the same time. Three lengthy letters to Lotus on how to install 1-2-3 on my Winchesters did not even elicit an acknowledgment, let alone an answer.

After reading about PC-DOS 2.0, I was first on the block to get a copy. The trouble

is, the maker of the hard disks doesn't have any software to tie into PC-DOS 2.0's theoretical capability, and I don't know how to do it myself.

Ideally, I'd love to allocate blocks of RAM for both electronic disk operation and print spooling that are available while I use the hard disks. The PC-DOS 2.0 driver in the manual only uses 180K and I want more than this, but I don't know how to change the driver, or write several drivers of them with different amounts.

Raymond L. Wetkins
Rye Brook, New York

A: First, your 832K of memory is causing trouble because it actually overlaps the memory in the display adapters, which are located right at 704K and 736K. When JFORMAT runs, it apparently uses as much memory as it sees available for RAM disk. In your case, this will include some of the memory in your display adapter. When you display characters, parts of the electronic disk will be filled with garbage. That could be very dangerous.

This is caused by JFORMAT determining how much memory is in your system by reading all of the bytes in order until it finds out where memory stops. Since there is no demarcation between the end of your user RAM and the video display adapter RAM, you'll have troubles here. A simple fix would be to disable the last 192K of memory and restrict yourself to 640K, which should suffice for most purposes.

Tall Tree Systems gets around this problem with its cards by not having all of their memory accessible at one time.

THERE
is no demarcation
between the end of your
user RAM and the video
display adapter RAM.

Instead, they use a bank selection approach. Switching between banks causes different pieces of memory on the card to be available to the computer. In this way, you could have over 1 megabyte to use for RAM-disk.

The SemiDisk cards (made by Semi-Disk Systems, Inc.) work even more strangely. They have none of the memory accessible; instead, the computer uses input/output (I/O) ports to address the on-card memory. This method takes up none of the address space used by programs and data.

To modify the PC-DOS 2.0 RAM-disk driver, you only need to change a few numbers to get the driver to have as much memory as you like. This will not solve the overlay problem, though.

If you feel like playing around with the device driver on page 14-27 of the DOS 2.0 manual, and have an IBM assembler, try changing the values of the BPB (starting at line 86) and the BOOT_REC (line 103) in tandem. One simple approach would be to have it act like a double-sided disk drive. See Figure 1 for the new BPB description.

In Figure 1 the bios parameter block (BPB) describes the RAM-disk. By doubling the number of available sectors to 720, we tell DOS that the disk can store

```

: double sided diskette bios parameter block
BPB EQU $ dw 512 :sector size
db 2 :sectors/allocation unit
dw 1 :number of reserved sectors
db 2 :number of FATs
dw 112 :number of directory entries
dw 720 :total number of sectors
db 0FDh :media descriptor
dw 2 :number of sectors occupied by FAT

```

You will also need to change line 248 from 2D00 hex to twice that, which is 5A00 hex. Also change line 269 to use a first FAT entry of 0FDh.

```

248 MOV AX, 5A00h; reserve 360K bytes
269 MOV DS: BYTE PTR SI[0FDh]; compatible with BPB

```

Figure 1: Modifications of BPB description to emulate a double-sided disk drive.

360K bytes: 720 sectors with 512 bytes per sector. Using a different number of sectors would work equally as well.

The file allocation table has one entry (at 1.5 bytes each) per allocation unit. An allocation unit is the storage increment used for files. Thus, by doubling the allocation units from one sector to two sectors, two things happen. First, the smallest non-empty file now takes up 1024 bytes,

rather than 512 bytes. Second, since there are twice as many sectors, but each allocation unit handles two sectors, the file allocation table (FAT) remains the same size (1.5 bytes per unit \times 360 units = 540 bytes); this means two sectors are needed.

If we were to keep the allocation units of one sector, then the FAT would need to be 1080 bytes (1.5 bytes \times 720 units) or

Making money is one thing. Managing it is something else.



The Smart Checkbook does the job. Manages your money the way you want it managed—easily.

Imagine: push a button and get family budget reports, net worth statements, tax records. Custom reports, too. Know where your monies go, accurate to the penny and well organized.

"Instant Reconciliation:" The Smart Checkbook doesn't just tell you if you're out of balance—it finds mistakes and corrects them on the spot. It even catches bank errors!

AND print checks, of course! With payee's name and address!

Advanced features? Split transactions and assign the amounts to the categories you choose. Track sales taxes and much more. And there's a practice account to get you started.

Yes: unlimited accounts, combined accounts, organized accounts. A 160k disk, holds up to 2,000 transactions. Bigger disks—even more.

The Smart Checkbook is available for the IBM-PC, PC-compatibles and most CP/M, CP/M-86 and MS-DOS computers.

Order today. \$149 complete. VISA and MasterCard accepted. Call 703-261-1621

Softquest Inc.
P.O. Box 3456
McLean, VA 22103



Trademarks:

The Smart Checkbook—Softquest Inc. CP/M and CP/M-86—Digital Research, Inc. PC-DOS—IBM MS-DOS—Microsoft Corp.

Discount IBM Software

Manufacturer/Product	List Price	Our Price
Micropro™		
WordStar™	\$495	\$278
MailMerge™	250	128
SpellStar™	250	128
InfoStar™	495	280
WordStar & MailMerge & SpellStar	695	380
845	400	
Sorcim		
SuperCalc™	295	170
SuperWriter™	295	218
Information Unlimited Software		
Easysolver II™	350	216
Easyspeller II™	225	139
Easysyller™	400	240
Lifefree Software		
VolsWriter™	195	125
Innovative Software, Inc.		
T.I.M. III®	495	350
Ashton-Tate		
gBASE II™	700	428
Bottom Line Strategist™	400	300
Financial Planning Language™	695	495
Nagy Systems		
CopyPC™	35	31
EDS		
Communicator™	100	88
Emerging Technology Consultants, Inc.		
EDIX Editor™	195	148
WORDIX Word Processor™	195	140
EDIX & WORDIX Laboratory Microsystems PC/Forth	390	250
100		
Computer Innovations, Inc.		
CBS & Compiler™	395	335
Peter Norton		
The Norton Utilities 1.1	80	88

We carry more than what's listed here!

- Check out our aggressive prices; please call or write for our latest catalog of IBM PC software.
- All software runs on IBM PC-DOS unless noted.

Terms of Sale

DEDUCT 3% FOR ORDERS PREPAID BY CHECK OR MONEY ORDER.

Orders may be prepaid by check, money order, VISA, or Mastercard. Orders paid by personal check will be held 10 days to clear bank. No waiting on Certified checks, money orders, or credit card charges. Credit card orders must include card type, number, expiration date, signature and phone number. Purchase orders are accepted from qualifying firms. No COD's please. California residents add sales tax.

Shipping by UPS unless otherwise specified. Add \$4 shipping and handling on orders under \$200. Overseas orders add \$10. UPS Blue Label Service available for an additional \$3. In-stock items are shipped within 24 hours. All products subject to availability. All prices subject to change without notice. Credit card orders only may call collect.

To order CALL: (408) 997-6533 or WRITE:



6531 Crown Boulevard, Suite 3A
San Jose, CA 95120

IBM® is trademark of International Business Machines Corp.

CIRCLE 314 ON READER SERVICE CARD

ONE OF THE problems with PC-DOS 2.0 is that its delivery was much later than expected.

three sectors, but storage would be allocated more efficiently.

The change from 64 to 112 directory entries is made just to keep to the PC-DOS conventions. You can actually pick any number you like. This value sets the upper limit on the number of files in the root directory. Also, since each entry takes up 32 bytes, the more possible entries, the more wasted space.

Chonging the media descriptor byte from FC to FD is also in keeping with the PC-DOS conventions. As for as I can tell, the media descriptor should never be used, except by the driver itself. Some PC-DOS 1.1 functions used this descriptor, but that practice is discouraged in PC-DOS 2.0, despite protestations to the contrary in the manual. For example, both 8-inch and 5-inch diskettes share the FD media descriptor byte.

The change made to line 248 alters the amount of room requested by the driver, in order to accommodate the additional storage required by a double-sided disk. (One paragraph is 16 bytes.)

The change of line 269 ensures that media descriptor bytes match. The media descriptor should be the first byte of the FAT; line 269 places the media descriptor there.

You might wish to try playing around with different values. Just make sure the FAT has enough room for all of the allocation units, and that you request enough storage on line 248.

Note that both the BPB and the boot record must be changed in tandem. Don't ask why the code doesn't read the BPB, rather than the value called BOOT.REC—I don't know. Also, don't ask why the driver code assumes that ES:BX, the pointer to the device request header, is unchanged between the device storage call and the device interrupt call. This is clearly a mistake, even though it works in PC-DOS 2.0.

For a simpler approach to setting up 360K of storage, just have your CONFIG.SYS file contain two lines of DE: VICE=RAMDISK.SYS or whatever you call the binary file. This will create two 180K RAM-disks for you.

You also wanted to know how to put 1-2-3 and other copy protected software on your hard disks. Unfortunately, copy protected truly means that you can not copy the software—you can forget about installing it on your hard disk. If you could do that, then you could just as easily install it on your neighbor's hard disk! It is unfortunate that manufacturers seem to be copy protecting more and more. Having seen the amount of illicit copying going on, I suppose I can't blame them, but it certainly makes life difficult for those of us who purchased the software.

As to using spooling and your Winchester's of the same time: you should be able to spool. If you are having trouble, then perhaps it is a hardware incompatibility problem. Spoolers and Winchesters

THE IBM PC has a number of interrupt lines available—seven by one counting method.

both use interrupts. An interrupt is a signal on a dedicated line (or wire) that tells the computer that something has happened. For the spooler, a signal would indicate that your printer is ready for another character. For the Winchester, an interrupt is often used to indicate that the data transfer is finished, or the SEEK operation is done. If the printer port and the Winchester use the same interrupt lines, then you will have trouble.

The IBM PC has a number of interrupt lines available—seven by one counting method—and you should be able to convince the QCS hard disk to use a different line if that is the problem.

My guess is that it is more likely that this problem is linked to your RAM-disk problem; it is not a function of the Winchesters, but the amount of memory you

have. You might contact QCS to see if the manufacturer can supply a DOS 2.0 driver for its Winchester drive.

Partitioning memory should be a relatively simple task. Your RAM-disk program will not conflict with any other programs. If you can get a spooler that is done via device drivers, as is the RAM-disk, then that should clear up everything. You might want to check with the board's manufacturer.

One of the problems with PC-DOS 2.0 is that availability has been poor; its delivery was much later than expected. As a result, hardware manufacturers are struggling to catch up. Expect that most of these problems will be solved when PC-DOS 2.0 compatible Winchester and spooler drivers are available.

THERE is no automatic technique for retrieving accidentally erased files.

Permanent Loss

Q: You mentioned in Volume 1 Number 11 that an accidentally erased file is forever lost ("Unerasing Files," page 77). This is not true. You can recover a file in two steps.

First, use DEBUG to load the file directory and find the 32-byte file reference. Change the first byte back to the original file name character and save the file directory.

Next, find out the file size, and then load the FAT. [Note: for an explanation of FAT, see my answer to "A Surfeit of Memory" this month.] Now, by starting with the FAT pointer in the 32 byte directory, you can move sequentially through the free sectors until the file is completely retrieved.

Tibor N. Vari
Wayne, New Jersey

A: I include this somewhat technical question to make a point: There is no automatic technique for retrieving accidentally erased files. Despite suggestions to the contrary, these methods just do not work reliably.

EVEN when you think you know a system inside- out, rereading the manual can let you discover system capabilities that you never knew existed.

Although you can guarantee that the sectors originally occupied by the file are now set as "unused," you cannot tell where those sectors are. They could be scattered throughout the diskette.

Changing the directory entry will retrieve the first allocation unit—512 bytes or 1024 bytes for single/double sided disks. Anything after that will be retrieved at random, although there's a probability you can find a string of sectors belonging to the file.

The only program I know of that reliably lets you retrieve a lost file is UnErase, one of Peter Norton's utilities. This program uses an interactive approach in which the user checks sectors that were marked "unused" one at a time to finally retrieve the complete file. Furthermore, there is no way to retrieve an accidentally erased program that's not in character format unless you know the original byte patterns of the program.

You can make a stab at retrieving a file by moving through the FAT to find unused sectors in order. This will work if the disk is not fragmented; this will be the case if the disk was recently formatted and is not full. Otherwise, forget it.

Better Input

A number of people wrote to inform me that there is a much simpler way to input a line containing commas than the method I suggested in Volume 2 Number 3 (see "Stringing Commas" on page 504). Their answer was to use the LINE INPUT statement. A typical program fragment might be:

```
10 LINE INPUT "Enter anything";  
anything$
```

20 PRINT anything\$
30 END

Although readers' comments ranged from friendly to acerbic, I would like to quote one from Glenn Bleakney of Wilmington, Delaware:

Your blopper points up the need for something that all users of computer systems must do periodically: read the manuals. Even when you think you know a system inside-out, rereading the manual can let you discover system capabilities that you never knew existed.

Well put, Mr. Bleakney.

The PC Tutor solves practical problems and explains points of general interest. If you'd like to see your questions answered here, drop a line to PC Tutor, PC Magazine, One Park Avenue, New York, NY 10016. /PC

Product Information Contact these manufacturers for further details.

PR 2300 Ink Jet Printer
Docutel Olivetti Corp.
(800) 447-4700

CIRCLE 552 ON READER SERVICE CARD

JFORMAT
Tall Trees Systems
1036 Los Altos Ave.
Los Altos, CA 94022
(415) 941-5500

CIRCLE 551 ON READER SERVICE CARD

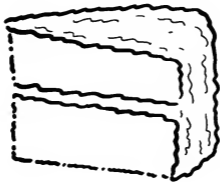
QCS
Quality Computer Services, Inc.
(QCS)
178 Main St.
Metuchen, NJ 08840
(201) 548-2135
(800) 631-5944

CIRCLE 550 ON READER SERVICE CARD

SemiDisk
SemiDisk Systems, Inc.
P.O. Box CG
Beaverton, OR 97073
(503) 642-3100

CIRCLE 549 ON READER SERVICE CARD

MicroGANTT™ XT makes project scheduling this easy...



Finally there is a fully interactive Critical Path program that allows novice or experienced computer users to derive a professional quality project plan, in just minutes. As you describe the work, MicroGANTT automatically displays the schedule of events graphically. Single keystrokes change the display from Gantt chart to time summary to financial summary. Carry up to 100 tasks in a single project. Incorporate that project as a task in an even larger project. The possibilities are endless! Change any variable entered at any time and see the entire projection recalculated, instantly. Project files can be used again and again. Simply alter the begin date, time scale, work week, worker dedication, or any factor, and the new schedule and critical path will appear immediately. No rekeying of data.

Run MicroGANTT XT on your fixed or floppy disk system and turn your IBM PC or XT compatible system into a powerful and versatile work management station. With MicroGANTT XT, it's a piece of cake!

Program and Documentation: \$395
Documentation alone: \$25

© 1983 Earth Data Corp.

Earth Data Corporation

P. O. Box 13168
Richmond, VA 23225

(804) 231-0300

CIRCLE 603 ON READER SERVICE CARD

PC: BlueBook

Rates and Information

PC: BlueBook is a high-response, low-cost source for advertising in the fastest growing computer market in the world. Advertisers choose between set categories and may include a logo. Display advertisers may cross-reference to their current display ad.

Circulation: 120,000 (net paid, April 1983)
Readership: 228,000 IBM PC owners and users
AD STYLE: 1 line Heading (23 characters maximum)
7 lines Body Copy (45 characters per line)
4 lines for Company name, address and telephone

RATES: Per Issue: \$150
Additional Lines: \$15 per line
Logos: \$225 (3 issues)
Minimum Order: 3 issues
Terms: Prepayment is required. Check, money order, American Express, Diners, VISA or MasterCard are accepted.

DEADLINES: November 6th for the January issue, on sale December 25th. Send your ad and prepayment to:
PC BlueBook
Classified Advertising, 12th Floor
One Park Avenue
New York, NY 10016
Advertising sales: (212) 725-4215
Customer service: (212) 725-4312

DISCSAVERS™
Multi-color vinyl sleeves for 5 1/4- and 8-inch diskettes that provide a 4-color filing system, durability, ease of labeling and secure fit. Packaged 12 or 10 (8) per box, they are available in red, blue, yellow and green. Ideal for home or office use.
(List Price: \$6.29 for 5 1/4", \$8.75 for 8")
ROCKROW, INC.
COMPUTER PRODUCTS DIVISION
7721 East Gray Road
Scottsdale, AZ 85260
(800) 526-2361, (602) 998-1577

COMPUTER COZIES®
Custom-made, quilted dust covers—anti-static, machine washable. Offered in 6 colors: gray, chocolate, cream, burgundy, navy or rust. Any cover can be made to order. SYS/MON (1 or 2 pc) & Hydrol \$50 per set. Nat. print: \$20. Wide print: \$24. Int'l unit prices available. Please see display ad this issue.
COVERS A LOT
PO Box 369
La Honda, CA 94020
(415) 747-0352

CUSTOM PRINTED T-SHIRTS
PROMOTE, IDENTIFY or ADVERTISE your Company, Products, Promotions, Sales Meetings, Product Introductions, Clubs, etc. ... No matter what needs promoting, there is nothing that can do it better or longer than a T-SHIRT. Please write or call for a free brochure.
HORSESHOE
20 Charlesbank Way
Waltham, MA 02154
(617) 894-9338

PC SUPPLY CLUB OF AMERICA
Members enjoy tremendous discounts and savings on all kinds of PC supplies: PC hardware/peripherals, software, diskettes, paper, ribbons, cables, furniture, monitors, etc. Name brands like IBM, 3M, Masell, Dysan, Okidata, NEC, Amdek, C. Itoh, etc. Send name and address for FREE 3 month trial membership and price catalog.
EXECUTIVE MICROSYSTEM, INC.
820 Jordan St., Suite 545
Strevport, LA 71101

FOR THE PC THAT HAS IT ALL
A kit-ful of useful accessories for your IBM® "QWIK-LABEL" identifies every slot, connector & control. "QWIK-KEY" marks them to indicate each function key's purpose. "QWIK-GLIDE" important operating instructions at eye-level. All of the above—\$7.75. ***CALL/PAD*** layout pad for spreadsheet users—\$4.75 each. Shipping \$1.
CA res. add 6%
COMPU-QUOTE
6914 Benquist Avenue, Dept PC
Canoga Park, CA 91307
(213) 348-3662

TOUCHDOWNS™: 8 ENLARGED KEYTOPS™ FOR THE IBM PC
BACKSPACE, RETURN/ENTER, SHIFT (2), TAB, Q/INS; CTRL, ALT. These nonglare KEYTOPS fit over the tops of existing control keys, providing easier reach and bigger targets. Specify color choice: IBM grey or charcoal. Order TOUCHDOWNS for only \$18.95 postpaid from:
HOLDEEN CO
PO Box 1810
Cottonwood, AZ 86326
(602) 634-4507

SELECTRIC ELEMENTS
We repair elements—broken top-handle-spring, tooth or hub, \$7.50 per element (or composer font)—guaranteed like new. New elements—standard styles—\$17.50 ea. Covers—\$15 ea. Several beautiful new styles available—\$27.50 ea. Write or call for brochure 5 day service on repair—new elements shipped immediately.
WELCH GRAPHICS
PO Box C-20667
Atlanta, GA 30320
(404) 763-8678

Business Opportunities

WRITERS-AUTHORS
Want to write your own microcomputer book? We're looking for writers who want to make money for their hobby. Be published by one of the largest, oldest microcomputer book publishers. Obtain your computer needs list or send your own idea by writing to our editorial dept.
TAB BOOKS, INC.
Blue Ridge Summit, PA 17214
(717) 794-2191

Accessories/ Furniture

DESK FURNITURE FOR IBM PC
A wood desk crafted only for the IBM PC with a shelf for the CPU and disk drive, a sliding keyboard tray that locks closed and a large storage drawer. Lots of working space. Highly functional wood furniture tailor-made for your IBM PC. Select black walnut and oak solid and veneers.
Catalogue free
CFG COMPUTER FURNITURE CORP
PO Box 2863
Chapel Hill, NC 27541
(919) 967-8104

DECORATOR COVERS FOR YOUR PC
As the discriminating owner of an IBM PC or other computer, express yourself by selecting a cover which shows who YOU are. Designs for hobbies, sports, animal lovers! Prices start at \$13.95 for typewriters. IBM PC \$22.95. Add \$2.50 shipping/handling. VISA/MC welcome. Ohio residents add 6%. Write/phone for information.
DECOREG Dept. ZP
Miami Valley Technical Services Corp.
PO Box 24449
Dayton, OH 45424
(513) 236-9923

Accessories/ Supplies

COMPUTER FORMS
Over 350 Computer forms including Checks, Statements, Invoices, Purchase Orders, Tax forms, and Letterhead. Forms designed for Peachtree Series 8, 40, 4, 5, BPI, Open Systems, MBSI, State of the Art, Accounting Plus, Great Plains, Commercial, Feeder, and Structured Systems. 24 hour shipment on blank stock.
CHECKS 10-60
8364 Hercules St.
La Mesa, CA 92041
NA (800) 454-2750
In CA (800) 552-8817
Local (619) 460-4975

VENTURE CAPITAL

available. If you have a new product or program but lack financial resources, we can help. We specialize in funding newly developed products. We've helped others, we can help you, too. Send a copy of your business plan and capital requirements—in strictest confidence—to:

MONARCH VENTURE FUND
1720 So. Amphlett Blvd., Ste 120
San Mateo, CA 94402
(415) 345-5700

AUTHORS

CompuSoft Publishing, home of the David Lein books (THE BASIC HANDBOOK, LEARNING IBM BASIC etc.), has been considering manuscripts from outside authors. If you have written a well organized, easy to understand how-to book, or are working on one, send a brief description, table of contents and S.A.S. envelope to:

EDITORIAL DEPT
COMPUFLOFT PUBLISHING
535 Broadway
El Cerrito, CA 94021

ENERGY MGMT—DE TIME SHARE

Entrepreneurs needed to establish Dealers and generate sales for incredible new Energy Conservation Analysis System. Includes hardware, software, and royalties from access to massive energy data base and programs on General Electric's Nationwide Timesharing System. IT'S WORTH A CALL!
GENERAL ENERGY TECHNOLOGIES
250 E. 17th St., #G
Costa Mesa, CA 92627
Box 2062 Newport Beach, CA 92660
(714) 645-7733

Computer Training

MICROCOMPUTER SEMINARS

Make money, save sales time, and close orders. Buy a seminar kit. 83 color slides, speaker's script, student handouts, and planning guide. Easy use, modular design, totally professional. Excellent training tool. Proven successful. \$350 complete, COD. Return within 2 weeks if not satisfied for refund.

COMPUTER LEARNING COMPANY
2038 Deladier Drive
Ranch Palos Verdes, CA 90274
(310) 371-8567

Consultants

ALASKA

**SOFTWARE BY THE MIDNIGHT
SUN**

Construction Management Consultants are developing software for the construction industry. Estimating and Job Costing are available along with graphics & plotter support. Critical Path Scheduling and inventory controls are being developed. Custom programming and assistance is only a phone call away.
RAMBO ENTERPRISES
 7-480A "I" Street
 Finerford AFB, AK 99506

CALIFORNIA

ABACUS PROGRAMMING CORP.

A large staff of PC experts: software & hardware selection, installation, training, local nets, main-frame interfaces, modify/develop custom software. In business 16 years helping large & small users: business & office systems, data base, graphics, communications, manufacturing, engineering tools, systems software
14545 Victory Blvd.
Van Nuys, CA 91411
(213) 785-8000

BASE II PROGRAMMING

Why try to fit your database needs into rigid software? Will design custom programs, abundant consultation/maintenance. IBM PC. For personal/professional/very small businesses. OR, dBASE II individual private tutoring. Correspondence/inventory/accounting. SF BAY AREA. Call to discuss your needs.
BOB LARZELERE, A CALIFORNIA CORP
1 Grand View Avenue
San Francisco, CA 94114
(415) 547-7899

FLORIDA

DENNIS M. NAGEL, INC.

Consulting service available for custom hardware and/or software design, product development, manufacturing or application of the IBM PC or other microcomputers. Extensive experience in communications, industrial control, data acquisition, custom electronics and microcomputers.

Dennis M. Nagel, PE
455 N.W. 35th St., Ste. D
Boca Raton, FL 33431
(305) 385-0515

MOST—YOUR HELPING HAND

Will assist you in all facets of your microcomputer use: planning, enhancement, and ongoing support. We help you get the MOST for your software \$ User friendliness is #1 Customized programming and most off-the-shelf packages supported, e.g. word processors, spreadsheets, data base, accounting, and more Training available

MICRO ORIENTED SOFTWARE TECHNIQUES
P.O. Box 1966
Casselberry, FL 32707-1966
(305) 689-4173

ELIMINATE UNCERTAINTIES

LOCAL area networking specialists with expertise in PC, XT, & IBM compatible system integration for professional businesses. Test software in your office on our portable before you purchase! Then we customize this software to meet your needs. Free 10 hrs of on-site training, 90 days on-site maintenance, & installation. Convenient leasing terms available.

MICRO HORIZONS
5881 Sunset Drive
South Miami, FL 33143
(305) 662-6609

MASSACHUSETTS

KRAKOW TRAVELING SEMINARS

Professionally developed seminars for the IBM PC, introduction, PC-DOS, dBASE II, 1-2-3, BASIC, advanced topics. I travel, you organize the group. \$100 per person/day (MIN. 15), & expenses for 1st 25 students. Save travel expenses. Seminars can be customized. **IRA H. KRAVOW AND ASSOCIATES, INC.**
12 Clearview Rd.
Stonham, MA 02180
(617) 438-6335

COMPUTER SYSTEMS LABS

IBM PC communications specialists. Professional systems staff highly experienced with software/hardware selection, training, installation and applications. Developer of PC/TIE, async communications software for IBM & non-IBM systems. Custom software for all PC/Host networks. Call or write for brochure.
HOWARD DEAN, SOFTWARE SYSTEMS
808 Shrewsbury Avenue
Tinton Falls, NJ 07724
(201) 842-5900

NEW YORK

JANCO CUSTOM SERVICES INC

We will develop customized software for the IBM PC integrating our technical skills with your application knowledge. Will enter into joint venture agreement with you to market the finished product. PACKAGES ALSO AVAILABLE CALL/WRITE. JAMCO CUSTOM COMPUTER SERVICES INC. 450 Seventh Ave., Suite 3105 New York, NY 10123 (212) 736-2542

TEXAS

LOCAL AREA NETWORKING

International consulting firm specializing in system integration of microcomputers. Application areas include terminal emulation, local area networking, and we are suppliers of many hardware and software products for the IBM PC. **PERSONAL COMPUTING DELTA INC.**
2000 Post Oak Blvd., Suite 1900
Houston, TX 77056
(713) 850-8445

Diskette Copy Service

COMPUTER MEDIA PRODUCTS

Desktop, Great Workbooks, Wordbooks
Diskette formatting and duplication on Memores, Verbatim[®], OEM diskettes. Virtually all formats. Copy protection and serialization available. Fast delivery for 50 to 100k copies. A dealer that carries accessories and supplies, data packs, magnetic tape, data cassettes, furniture, terminal work stations, storage devices. Master distributors for Verbatim[®], Memores.
COMPUTER MEDIA PRODUCTS
5482 Compton Street
San Diego, CA 92123
(619) 565-7802

Original program duplication to retail ready assembly. Professional service organization designs and produces custom packaging for newly developed programs. Each package is created per client specs and integrated with marketing and merchandising methods. Boxes, bags, binders, slip boxes, shrink and rack packs.

VIO MANAGEMENT
296-A Ocean St.
Hyannis, MA 02601
(617) 776-6522 or (800) 343-1292

Uptime guaranteed duplication for virtually all systems and formats using sophisticated reliable equipment. Serialization, copy protection (encryption), and packaging available. Double boot for Apple and TRS. Supplied on OEM quality Allenbach diskettes. Rapid delivery for 100 to 100,000 copies.

ALLENBACH INDUSTRIES, INC.
2101 Las Palmas, Ste. A
Carlsbad, CA 92008
(800) 854-1515, (619) 438-2258

Aggressive, rapidly expanding publisher is looking for experienced computer-book editor to edit and develop growing line of how-to computer books. Must have solid technical knowledge of computers, programming and software. Demonstrated ability to turn computer jargon into precise, user-friendly instructions. Ability to find and manage computer authors. Excellent salary and benefits. Join leading trade paperback publisher in sunny southwest. Resume to: Personnel Dept. HPBOOKS Box 5367 Tucson, AZ 85703

256K Quadboards \$425.00 DELIVERED! CODRAM, INC. has all QUADRAM Products at mail order prices. All products carry the Quadram warranties. We try to beat all advertised prices. Call or write for a complete price list:
CODRAM, INC.
P.O. Box 1054
Lithium, GA 30247
(404) 925-0540

54K, 128K, 192K, 256K bytes with parity. Socketed for easy memory expansion with base memory address selectable on 64K, 128K, 192K, or 256K boundaries. Two RS232 ports (COM1; COM2); and one parallel port (LPT1; LPT2; OR LPT3); each port may be individually disabled.

ANATRON, INC.
202 W. Bennett St.
Saline, MI 48176
(313) 429-2676

Quadboard combines six most-needed PC functions onto one board. Features parallel port, serial port, chronograph, memory expansion from 64K to 256K, plus QuadMaster software with QuadRAM Drive and spooler. Retail for \$595 (256K), \$395 (64K).
QUADRAM CORP.
 An Intelligent Systems Company
 4355 International Blvd.
 Norcross, GA 30093
 (404) 923-6666
 TWX 810-923-6666

Quadboard II provides the PC with a six-function expansion card: two serial ports, chronograph, memory expansion from 64K to 512K, plus QuadRAM Drive and software spooler. Retail for \$595 (256K), \$395 (64K).

QUADRAM CORP.
An Intelligent Systems Company
4355 International Blvd.
Norcross, GA 30093
(404) 923-8666
TWX 810-923-8666

Quadram's IPC—parallel interface card for IBM PC—consists of standard Centronics connector, pin-out, and timing with handshaking. Complete with an eight-foot cable, IPC operates most parallel printers such as the Epson and IBM Dot Matrix System Printer. Card with cable retails for \$110.

QUADRAM CORP.
An Intelligent Systems Company
4355 International Blvd.
Norcross, GA 30093
(404) 923-6666
TWX 810-923-6666

Quadram's chronograph eliminates having to enter the system's date and time at boot-up. This and current software are provided to access seconds, minutes, hours, month, date, and year through normal system and basic commands. An on-board battery keeps the chronograph running even with the system off. Retail: \$110. QUADRAM CORP.
An Intelligent Systems Company
4355 International Blvd.
Norcross, GA 30093
(404) 923-6666
TWX 910-923-6666

Quadram's fully-tested and burned-in memory boards are fully socketed with parity checking. They are user-expandable and available for \$275/\$64K or \$425/\$192K. Standard 64K dynamic RAM chips are used on the board.

QUADRAM CORP.
An Intelligent Systems Company
4355 International Blvd.
Norcross, GA 30093
(404) 923-6666
TWX 810-923-6666

The serial RS-232C async adapter board is fully compatible with IBM hardware and software, and is available with either dual or single ports. The dual port version enables the user to operate two devices from one system expansion slot. Retailers from \$110 with optional dual port. Expansion kits are available for \$45.

QUADRAM CORP.
An Intelligent Systems Company
4355 International Blvd.
Norcross, GA 30093
(404) 923-6666
TWX 810-923-6666

A full half-megabyte, 512K RAM is available with Quad 512+. This four function PC board contains one serial port, QuadMaster software with QuadRAM Drive and spooler. Retailers from \$325 (\$4K), \$550 (256K), and \$895 (512K).
QUADRAM CORP.
An Intelligent Systems Company
4355 International Blvd.
Norcross, GA 30083
(404) 923-6666
TWX 910-923-6666

IBM quality plus Easitech Excellence exclusively at IBM PC dealers worldwide. Memory (64K-256K), spooler, printer and modem connections, three electronic disks, chronograph and more. No need to search for low prices. Our lowest prices are at authorized IBM PC dealers only. \$325 to \$595. EASIBOARD by EASITECH.



EASITECH CORP.
2215 Perimeter Park, Suite 22
Atlanta, GA 30341
(404) 452-7576

The Hercules Graphics Card offers bit mapped Graphics on the IBM monochrome display. There is a parallel printer port and two graphics pages each with a resolution of 720h by 348v. It is compatible with 1-2-3 and text mode software. Price \$499. See our display ad this issue.

HERCULES COMPUTER TECHNOLOGY
2550 Ninth St., Suite 210
Berkeley, CA 94710
(415) 540-8000

Powerful multi-function board enables you to add up to 512 KB RAM, calendar clock, parallel printer support, and up to two additional serial communications ports—through just one PC slot. Plug-in modular design makes expandability easy. Board comes with RAM disk memory and print spooling software to make any PC more productive.

PERGYST Personal Systems Technology
15601 Rockfield Blvd., Suite A
Irvine, CA 92714
(714) 859-8871

Hardware/ Storage Devices

WINCHESTER SUBSYSTEMS

Tallgrass Technologies offers a family of Winchester HardFiles and streaming tape by file backup for the IBM PC. With formatted capacities from 6.25MB to 70MB, Tallgrass has a HardFile System to fit the most stringent of data processing applications. From \$2995 including integral tape backup.

STEVE VOLK/VIP MARKETING
Tallgrass Technologies
11667 West 90th
Overland Park, KS 66214
(913) 492-6002

9 TRACK TAPE CONTROLLER

Read and write in 9 track magnetic tape. Gain access to the most widely used media for information exchange in the world. Use with Perlec compatible (Cibex, CDC, Kenedy, etc.) formatted tape drives at speeds up to 125 ips. Compatible with interconnect cables and software. List \$770 + shipping.
COVERLAND DATA INC.
1425 Monte Rico Dr.
El Cajon, CA 92021
(619) 447-1908

QCS HardDrives

QCS offers external Winchester Subsystems with capacities of 10 to 83 MB for the IBM-PC, COMPAQ, Columbia & TI Professional. Backup to floppy or optional 5MB removable cartridge drive with state of the art utilities. Fast, Reliable, Expandable. From \$2499.
CUCAS, Inc.
3 Outlets Drive
Metuchen, NJ 08840
(201) 548-2135, Telex 299410

DOUBLE NICKEL DISK DRIVE

5 MB fixed/5 MB removable 5 1/4" "true" Winchester dual disk drive with cartridge providing same access time, data rates and random access as fixed drive. Adds mass storage, security, data portability, and back up to DOS 2.0 USCG-P. CDP/M-86 system. PC adaptor combines floppy, SASI and serial port into 1/0 slot.
NANC INTERNATIONAL
511 11th Ave. South, Suite 429
Minneapolis, MN 55415
(612) 333-4303

Mailing Lists

IBM MAILING LISTS

Over 75,000 names of IBM personal computer owners (owners increase daily) available for rental on labels or magnetic tape. Total 550,000 including other brands.
JRV BRECHNER
TARGETED MARKETING, INC.
Box 453
Livingston, NJ 07039
(201) 731-4382

PROFILES OF STORES & USERS

Q can provide names & addresses of a) over 2,450 retail computer stores surveyed via the telephone, b) new personal computer users (i.e., IBM, Apple, Osborne, etc.) Both can be tailored & used for mailing lists, telemarketing or direct sales. Call (819) 450-1667.
COMPUTER INTELLIGENCE CORPORATION
3344 North Torrey Pine Ct.
La Jolla, CA 92037

Publications/ Catalogs

FREE DIRECTORY

32 pages on top-quality software at mass-production prices. Integrated accounting system and payroll, ultimate data base manager, advanced inventory, mailing list, text formatter, and many more. Send a legal-size, self-addressed, stamped 37-cent envelope to:
MICRO ARCHITECT INC.
6 Great Pines Ave.
Burlington, MA 01803
(617) 643-4713

PC BUYER'S GUIDE

An Independent Guide To Products and Services For IBM Personal Computers. The authoritative reference that lists, describes, rates for ease of use, and tells you about the latest in software, hardware, accessories, supplies, books, services, etc. From the publishers of PC. An ideal gift at only \$7.95 (+ \$1.00 shipping/handling to U.S. destinations, and \$10.00 (+ \$3.00 + r/t) elsewhere. (U.S. funds only). Residents of CA, CO, CT, DC, FL, IL, MA, MD, MI, NY, and VT, add applicable sales tax. Mail to:
PC BUYER'S GUIDE
P.O. Box 555
Morris Plains, NJ 07950

FREE BOOKS-DISCOUNT SOFTWARE

Save on BESTSELLING IBM PC Educational, Personal and Game Software and receive your choice of one or two popular computer books free. Write for details and free catalog.
APEX SOFTWARE CENTER
P.O. Box 871
Medina, Ohio 44258
(216) 725-4240

NEWSLETTER ON CAPITALISM

Your IBM computer has given you freedom. So has capitalism and the free enterprise system. Program yourself to read ON PRINCIPLE, a stimulating, informative 8 page bi-weekly letter of political and economic news analyzed from a free-market perspective. \$45 for 26 issues, 5-issue trial \$10.
ON PRINCIPLE PUBLISHING INC.
Pinceton Professional Park
601 Ewing St., Suite B-7
Pinceton, NJ 08540

MODERN NOTES

A monthly newsletter for online data base searching, electronic mail, BBS, and other information services. Includes valuable search strategies and tips as well as applications for using on-line and online data bases. Edited by information broker Katherine Ackerman. 12 issues \$24. Please send for Sample issue.

MODERNNOTES

P.O. Box 408472
Chicago, IL 60640
(312) 754-7407

USER'S GUIDE, OBASE II

This is a comprehensive programming guide to obase II. Contains programming instructions for beginners and advanced programmers. Dose it add one such as dialog, dail, are reviewed in detail. Over 200 pages. Contains a complete Accounting system with Payroll, Accounts Receivable, Accounts Payable, and General Ledger. Source Code, data descriptions, and a users guide are also included. Orders accepted 24 hours, VISA, and MasterCard accepted. Price: \$39.95.

AUTOMATIC COMPUTER SOFTWARE

P.O. Box 290336
San Antonio, TX 78280
(512) 692-2637

THE LAWYER'S PC

A twice-monthly newsletter for lawyers using the IBM PC & compatibles. Written in plain English, the newsletter will give you practical information to turn your IBM PC into your best investment ever. \$56/year (24 issues) U.S. MC/VISA. Money back guarantee on unmailed issues. Subscribe today or ask for FREE info.
R.P.W. PUBLISHING CORP.
P.O. Box 729A
Lexington, SC 29072
(803) 359-8941

COMPUTER WARE

Order computer hardware, software, and accessories at discount prices. Send \$1.00 to cover postage and handling for prices of items including LEADING EDGE PRODUCTS, CONCORD software, HAYES modems, keyboards, add-on boards, dust covers, shipping cases, and more.
MICRO WARE PLUS
93 E. Robinson
Fresno, CA 94704

Retailers

CALIFORNIA

COMPUTERLAND OF LAGUNA HILLS

Specializing in corporate sales and employee purchase plans. IBM authorized in-house and on-site service. COMPAQ, CORVUS, PERYSYST and other peripherals.
24241 Avenida De La Carrieta
Laguna Hills, CA 92653
(714) 859-8912

COMPUSHACK OF S.E.V.

IBM PC & XT. We specialize in sales and service of IBM personal computers. Extensive line of add-on memory boards, printers, monitors & software for the IBM PC. Different configurations and IBM compatible accessories. Full service and repair center. We service what we sell and a lot more! Open evenings and Saturdays.
17139 Ventura Blvd.
Encino, CA 91416
(818) 906-7000

COMPUTERLAND OF VISALIA

We carry a full line of hardware and peripherals in stock. Training and basic programming courses available.
1750 S. Mooney Blvd.
Visalia, CA 93277
(209) 739-1033

FLORIDA

COMPUTERLAND: WEST PALM BEACH

Mon.-Sat. 10 a.m. to 6 p.m. Full service and support for PC, compatible hardware and software. Classes in programming, consultation all levels.
4275 Deschamps Blvd.
W. Palm Beach, FL 33409
(305) 884-3338

We have everything from high-accuracy calculation packages for professional astrologers to programs like **ASTRO-SCOPE™**, that print multi-page, natal, forecast, relationship and numerology interpretations for everyone. Programs print the chart and include a license to sell the copyrighted text output.

AGS SOFTWARE
Box 28, Dept. C
Orleans, MA 02653
(617) 255-0510

The Philatelic Management System™ is superior software for every level of collector. This powerful, easy-to-use package was professionally developed with over 40 programs specifically designed for philately. For IBM PC & Apple. Until Jan. 1, 1984, \$219—regularly \$295. Demonstration Package \$15.00, credited to final purchase.

SOFTSTYLE, INC.
7192 Katarianacle Hwy., Suite 200
Honolulu, HI 96825
(808) 396-6368

Tailored to your territories and the companies you represent, this extremely flexible and comprehensive rating package provides the competitive edge in quoting for prospects and customers alike. Easy to use rate update program puts you in driver's seat. Installation & ongoing support available. CPW, PCDOS, MSDOS, UNIX, and others.

MDG ASSOCIATES
P.O. Box 108
Orchard Park, NY 14127
(716) 662-6621

Designed by insurance professionals for independent insurance agents, this integrated system performs: Customer acctg., general ledger, client data update and retrieval, over 100 marketing reports and sales tools, ACORD's. Easy main menu and HELP feature. IVANS, IBM-PC, CP/M, Turbodies
APPLIED SYSTEMS
Pauling Rd.
Monee, IL 60449
(312) 634-5575

A program designed for auto parts, hardware, equipment, and other part-number oriented industries. Prints invoices, statements, and management reports. Color- and menu-driven. Program keeps track of monthly, quarterly, and yearly unit sales. Floppy or hard disk. Both cash or accounts receivable versions available.

INTELLIGENT BUSINESS SYSTEMS
10 S. Fourth Street
Clarksburg, WV 26301
(304) 624-7488

For restaurants, wine bars—micro CELLAR-MASTER maintains wine and liquor inventory data for up to 40 locations. Automatically formats and prints beautiful wine lists. Produces many administrative reports including sales analysis, reorder, and inventory value. \$750. Dealer/consultant inquiries encouraged.

JUPITER ISLAND CORPORATION
1900 Powell, Ste. 1135
Emeryville, CA 94608
(415) 655-0840

International Group with more than 3,000 clients. Master file updates, incoming and outgoing products, free exploration of inventory, price list, daily record, indexing of files, cost analysis (LIFO/FIFO, etc.), maximum and minimum inventory. Hardware card \$20. Program \$395. Manual \$20. Cash, check, M.O., AMEX. Free brochure.

LOGIC CONTROL, INC.
10691 N. Kendall Drive, Suite 205
Miami, FL 33173
(305) 274-7185

Main features are receipts and issues updating, report generation including inventory, usage and reorder listings, screen display of one, several or all stock items; price quotes, reorder point self-adjustments and comprehensive file maintenance to add, change and delete stock items. List Price: 120.00. Manual alone: 15.00.

R.J. SYSTEMS
106 New Haven Avenue
Milford, CT 06460
(203) 878-0376

Fixed wing aircraft and/or helicopters. Gives maintenance status of components and forecasts parts coming due for service. Inventory allows 20 character part numbers and supports multiple locations. GL, AP and AR systems especially for the aviation industry are also available.

ROCKY MOUNTAIN COMPUTER SYSTEMS LTD.
4427 Dahlhart Road NW
Calgary, Alberta, CANADA T3A 1B8
(403) 286-8804

A package of 5 interactive language interpreters (APL, BASIC, COBOL, FORTRAN, Pascal) and a full-screen editor. Full-screen and function key support allow text to be modified without entering commands. Color/graphics support is provided in languages except COBOL. Host communications gives access to mainframe files by programs on the PC. U.S. inquiries: WATSOFT PRODUCTS, INC. 158 University Avenue West Waterloo, Ontario N2L 3E9 (416) 686-3700

A complete, *withdrawn* single-user implementation of the IBM/ACM standard re-syntax and semantics of statements, operators, primitive functions, input/output forms, and defined functions. No significant design limitations on rank/shape of arrays or name lengths. Color/graphics, files of arrays, PEEK/POKE/SYS-like functions. U.S. Inquiries.

WATSOFT PRODUCTS INC.
158 University Avenue West
WATERLOO, ONTARIO N2L 3E9
(519) 886-3700

The most complete language available for the PC. Comprehensive 420 page manual. Complete interface to DOS and BIOS, including graphics, video interface, parallel and serial ports, light pen, joy-stick, sound, color, DOS file access. Double screen editor. The only full FORTH 8086 Assembler. See our ad this issue.

QUEST RESEARCH, INC.
303 Williams Ave
Huntsville, AL 35801
(800) 568-8068 or (205) 533-9405

A complete APL, plus the most complete control of machine language and I/O and file devices: from within APL. 20 digit precision, nested arrays, mixed data types, 1 megabyte addressability. APL \$495 Manual \$35 Ask about the IDEAL BAS-APL (integrated BASIC and APL), IDEAL CALC, IDEAL WORD and IDEAL 4-5-6. U.S. Inquiries.

IDEAL COMPUTER SYSTEMS
66 Robie Street, Fundy Trail Mall
Truro, Nova Scotia B2N 1L8 CANADA
(902) 695-8062

AVAILABLE NOW! Full LOGO language, plus ... Simple screen editor • Music • Painting • Decimal floating-point arithmetic • Save and recall pictures on disk • Explicit error messages • Tutorial and reference manual. Requires IBM PC or XT with 128K RAM, diskette drive and color monitor, \$180. Quantity discounts. VISA, M/C, AmEx. U.S. inquiries.

WATERLOO MICROSYSTEMS, INC.
175 Columbia St. W
Waterloo, Ontario Canada N2L 3B6
(519) 884-3141

SSI*FORTH is a FIG compatible FORTH development system for the IBM PC. It includes assembly language core modules for selected 16-bit micros and source code for all FORTH words. A screen-to-text and a text-to-screen format converter is also included. \$95.00.

SATELLITE SOFTWARE INTERNATIONAL
288 West Center Street
Orem, UT 84057
1-(800) 321-5906 or (801) 224-8554
Contact: Ann Gates

MetaBASIC

A powerful language preprocessor which greatly simplifies program development in BASIC. A key feature is the ability to use Subprogram CALLs with arguments. Also, programs developed for Interpretive BASIC are automatically "compressed" into their optimal form to maximize execution speed while minimizing file size. Only \$59.

SOFTWARE 128
363 Walden Street
Concord, MA 01742
(617) 369-6400

UNIFORTH

Our floating-point, PC-optimized FORTH is now only \$129 (U.S. postage paid) included are: All transcendental functions, video editor, macro assembler, FORTH-79, complete DOS support, 64kb program/1146 data space. Our 200-page User's Manual is unequaled. Specify software or 8087 support. No credit cards.

UNIFIED SOFTWARE SYSTEMS
P.O. Box 2644
New Carrollton, MD 20784
(301) 552-9590

S40FORTH—IBMPC LOOK ALIKE

A program development system for the IBM/PC. Compatible with DEC PDP-11 & Osborne CPM versions. Screen editor with screen print & copy routines, function key & key pad commands. Decompiler displays components of FORTH words in dictionary. Extended memory, disk dumps, music & sound routines, BIOS ROM access, DOS functions & files, floating-point operators, random numbers & mail list program with high level source demonstrates programming tools. \$40

miLISP™—83

An integrated environment for AI software development. Includes a high performance, pseudocode LISP compiler, a resident, screen-oriented editor and debugging system; interactive LISP programming lessons; and a detailed reference manual. \$250. Also the muMath Symbolic Math System, \$300.

FORLIB-PLUS

3 supplemental, assembly code, Fortran Libraries supporting graphics, communications and file handling. DOS 2.0 compatible. Additional features include program and data chaining and interrupt driven buffer communication. Microsoft 3.1 Fortran and IBM Fortran compatible. \$69.95. CA res. add 6%.

ALPHA COMPUTER SERVICES
P.O. Box 2517
Cypress, CA 90630
(714) 894-6808

Software/Legal

SSI*LEGAL

SSI*LEGAL is a comprehensive legal time and billing system for the IBM PC. Supporting up to 99 lawyers, 99 billing formulas, 99 job types, 9,999 clients, 9,999 cases per client and 100,000 current charges via a built in data base, SSI*Legal is a powerful and easy to operate system. \$495.00.

SATELLITE SOFTWARE INTERNATIONAL
288 West Center Street
Orem, UT 84057
1-(800) 321-5906 or (801) 224-8554
Contact: Ann Coates

ATTORNEY SYSTEM

A legal time and billing system written in dBASE II (thus transportable) for the IBM PC. (Crunched code dBASE II not necessary.) Same design has run for several years on PDP-11/70's and last year on a VAX—software has no size limitations. For floppy disk PC's it will support 10 lawyers, 500 clients, 1500 cases. \$475.

WOOTEN, INC.
Suite 1204, 50 Broadway
New York, NY 10004
(212) 422-3818

REAL ESTATE CLOSING PKG.

Prepares all documents required for real estate closings: Buyer/Seller closing sheets, RESPA, promissory notes, mortgages, deeds, affidavits, amort sch, etc. Also ESTATE TAX 706, a program to prepare estate tax returns and FIDUCIARY TAX 1041, a program to prepare estate and trust income tax returns.

MARINER SOFTWARE, INC.
P.O. Box 2564
Port Charlotte, FL 33949-2564
(813) 639-3945

Software/Mailing Programs

PONY EXPRESS

Prints on labels 1 to 5 across or master list print-out on 80 or 132 character wide paper. Also CHESHIRE FORMAT. Super fast 4 way sort. Unlimited files. Multi-file merge. Record selection by unlimited user selection codes. Includes phone list option. Correction and deletion routines for updating. Auto-repeat for ease of record entry. \$169.

COMPUTECH
975 Forest Ave.
Lakewood, NJ 08701
(201) 364-3005

HARDCOPY E-MAIL

interface to U.S. Postal Service's E-CDM network. Transmit your letters directly to a Post Office; they print and deliver as first class mail. Our P-COM software handles all E-CDM formats, includes a special word processor, mailing list program, formatting programs and communications program.

FOGLE COMPUTING CORP.
P.O. Box 5166
Spartanburg, SC 29304
(800) 845-7594

BASE MAIL-SYS FOR PC'S

Personal/Business mail system in dBASE II. Prints 1 up labels, subtotals of \$ amount by code type, and list of all records. 25 menu driven, modifiable, programs include: record select by last name, entry w/auto-repeat, add, delete, verify delete, dup chk, backup, on-screen instructions, etc. BEST BUY \$20.00.
J & S CO.
2629 Cory Terrace
Wheaton, MD 20902
(301) 258-0077

Mail list for FinalWord

Mail-merge package for FinalWord includes programs for maintaining multiple name and address lists, printing mailing labels, and preparing correctly formatted control files for use by FinalWord in preparing form letters. Programs in BASIC and supplied in source code form to allow user modification. \$75.

MASCOT SYSTEMS
7022 Bridgeport Circle
Stockton, CA 95207
(209) 952-4498

VOIKS-MAILER PLUS

- * Works with your Vollerwriter!
- * Store & Print—Name/Address/Phone/misc.
- * Selective File Printing * Form Letters
- * Mailing Labels * Multiple Document Copies
- * EASY to USE—NO MANUAL REQUIRED!
- * PLUS—Integrated Calculator Function.
- * \$47.50 + \$2.00 Shipping, MC & VISA OK

VISA-MARC
 132 Central Way, Ste 3
 Kirkland, WA 98033
 (206) 453-2262

Software/
Manufacturing

MYTE MYKE MANUFACTURING

CONTROL SYSTEM integrates with **BUSINESS SYST** & features mainframe capabilities. **STD COST** ... bill of material and operations routing provide where used, same as except, & projection capabilities. **SCHED/FORECASTING, MRP, SHOP FLOOR CTRL, & PRODUCTION RPTG.** are included. Install & support avail. **CP/M, PCDDOS, MSDOS, UNIX** & more.

MDS ASSOCIATES
P.O. Box 108
Orchard Park, NY 14127
(716) 953-4621

Software/Medical

MEDI-R₁

Comprehensive Billing, A/R, & Collection system for the Medical Office. Flexible operating procedures and highly user oriented, this system was developed in a real practice environment. Many unique features with emphasis on improved cash flow and collections. In COBOL, requires hard disk, 128K, PC-DOS. Retail at \$3500...Outstanding direct sales package.

PHOSE SOFTWARE
1503 Nora Drive, Suite F
Arlington, TX 76013
(817) 261-4436

POS/1™ Version 4.0

Medical billing and accounts receivable system. Produces statements and insurance forms. A/R aging and revenue analysis with Bar Graphs. Multiple doctors, practices, insurances. Day sheets, recall notices, referring physicians, audit trails, ledger details. Online update and access by account # or name. Customizable procedure and diagnosis codes; menu-driven help screens; supports 3 printers. PC-DOS 2.29/3, hard disk \$2250.

CHEN INFORMATION SYSTEMS, INC.
1490 Bayshore Hwy., Suite 205
Burlingame, CA 94010
(415) 652-4358

THE SURVEY SYSTEM

An easy to use, menu driven system for the entry, editing, processing and presentation of questionnaire data. The system can produce cross-tabs and scores in banner format, statistics and bar charts. Tables and charts are camera-ready for professional presentations. \$495. Card readers and open-end coding analysis options available.

CREATIVE RESEARCH SYSTEMS.

1864 Larkin Street, #2
San Francisco, CA 94109
(415) 771-0912

FORTTRAN SUBROUTINES

100 subroutines covering data screening, correlation & regression, design, discriminant factor & time series analysis. Nonparametric statistics, generation & distribution functions, matrix & storage operations. Eigen analysis, matrix & polynomial solutions & misc. linear analysis. SOURCES INC. 8087 object code avail. \$295. CA res. 6% Check or money order.

ALPHA COMPUTER SERVICE

P.O. Box 2517
Cypress, CA 90630
(714) 894-5808 The Source, STA550

BMSTAT

BMDSTAT includes over 30 programs of the BMD statistical series, plus many advanced BMDP features. Mainframe capacity (up to 80 var.) for uni- (e.g., ANOVA, regression) + multivariate (e.g., canonical, factor) analyses; time-series, crosstab, plots, and much more. 8087 support. opt. 128K. DOS. \$325.

SIGNIFICANT STATISTICS
3336 N. Canyon Road
Provo, UT 84604
(801) 377-4860

TEN STATISTICAL TESTS

1 YEAR SUBSCRIPTIONS
 Bivariate and Fisher Exact Probability, Chi Square
 With Contingency Coefficient, Cochran Q,
 Friedman Two Way Analysis of Variance, Ken-
 dall Coefficient of Concordance, Kolmogorov-
 Smirnov One and Two Sample, Kruskal-Wallis
 One Way Analysis of Variance by Ranks, Mann-
 Whitney U Test, Spearman Rank Correlation
 Coefficient, Wilcoxon Matched-Pairs Signed
 Ranks IBM 64K Price \$34.00.
1 & H SOFTWARE
 1027 Whittier
 Emporia, KS 66801
 (316) 343-1915

STATISTICIAN'S MACE

EASY TO USE program calculates descriptive stats, multiple regression, correlations, several ANOVAs, nonparametric tests, and other statistics used by scientists, business researchers, engineers. Accepts keyboard or disk file input. Requires 128K, PC/MS DOS, 1 disk. Price \$195. Evaluation version \$30.

MACE INC.

2313 Center Avenue
Madison, WI 53704
(608) 241-4566

DATA ANALYSIS SOFTWARE

Menu-driven, file-oriented programs with on-screen instructions & examples of all data structures. STAT-PAK is a suite of powerful univariate procedures (\$120). UTILITIES plots histograms of STAT-PAK files and converts DIF files to the STAT-PAK format (\$30). MULTIREG performs multiple regression (\$30).

SCIENCE SOFTWARE

RFD 2, Box 63
Nelsonville, OH 45764
(614) 753-1397

Software/Stock Analysis

MARKET MAESTRO

A technical system for stock selection and timing. Runs on IBM PC, TRS 80 II and Osborne. Generates buy and sell signals on any stock. Data may be entered manually or downloaded (e.g. from CampusServe) using a modem. \$125 (tax deductible). For a brochure
AJH SYSTEMS
 3032 S. Swainsbury #56
 Denver, CO 80227
 (303) 865-8062

WALL STREET WINDOW

- New comprehensive stock plug. Extensive ANALYSIS—moving avgs., stock comparisons, trends, and more
- Clearest GRAPHS hi-res., price, vol., & to printer
- Complete PORTFOLIO mgmt. SPREADSHEET compatible
- AUTOMATIC access to Dow Jones, Compuserve, retrieves updates, packs more data (historical & current quotes), \$395. Demo \$75.

R & O SOFTWARE ASSOCIATES
PO Box 2727
Reston, VA 22090
(703) 475-8587

STOCK PORTFOLIO REPORTER

STOCK PHOTOLOG REPORTER
Provides up to the minute information on key parts of investor's stock account. Market price updates by **DOW JONES**; easy link to **Hayes Smart modem**. **SORT** by P/E, gain loss, yield or any item in **SPRI**'s 8 useful reports. Friendly menu displays & manual. Requires 128K, 2DD. Demo disk avail. \$179 VISA/MC welcome.
MICRO INVESTMENT SYSTEMS, INC.
PO Box 8599
Atlanta, GA 30306
(404) 882-3194

STOCK TREND ANALYZER

Graphic representation of buy/sell indications based on resistance and support theories. System has been in existence for over 10 years. \$125 includes documentation/instructions. (For IBM PC, Apple, CP/M systems)
LOGIC UNLIMITED
7405 University St., Suite 1
Des Moines, IA 50311
(515) 274-2541

Software/Terminal Emulation

BLUE LYNX

Let your IBM/PC or XT replace your dumb terminals. The BLUE LYNX hardware board with associated software emulates the 5251/12 for the S/34, S/36, & S/38 as well as the 3275 for the larger 43XX and 30XX mainframes, both bi-sync and SDLC versions. TECHLAND specializes in communications. BLUE LYNX is only \$690. TECHLAND SYSTEMS INC.
25 Waterside Plaza
New York, NY 10010
(212) 684-7788

IBM-PC 3270 SERIES EMULATORS

AST is shipping the lowest cost Remote 3270 Series product for the IBM-PC. The package includes an Advanced Communications Card and Software which emulates a 3274 Control Unit, 3275 Station, 3287 Printer, and 3270 RJE Terminal. The product supports the SNA/SDLC Communication Protocol and lists at \$895.00.

OR JERRY DROZ, MARKETING DIRECTOR
AST RESEARCH INC.
2372 Morse Avenue
Irvine, CA 92714
(714) 540-1333

IBM-PC 5251 SERIES EMULATORS

AST is selling a System/34 and System/36 Remote Work Station emulator. The product makes the IBM-PC look like an IBM 5251 Model 12 Display Station. The product supports SNA/SDLC LU7 and LU4 functions at speeds to 9600 bps and can operate with existing S251 Clusters in a Communication Network.

OR JERRY CROSS, MARKETING DIRECTOR
AST RESEARCH INC
2372 Morse Avenue
Irvine, CA 92714
(714) 540-1333

IBM-PC 3780 REMOTE TERMINAL
EMULATOR

AST has installed IBM-PC 386 Emulators at over 400 major corporate sites. The Communication Card and Software allows connection of the P.C. to IBM 3070, System 34's, 4300 Series Systems and DEC and Wang Bcync supported minis. You can transfer files dynamically even in an unattended mode at speeds to 38.4 kbit. The Bcync Protocol gives the highest data transfer reliability and speed.

DR. JERRY GROSS, MARKETING DIRECTOR
AST RESEARCH INC.
2372 Morse Avenue
Irvine, CA 92714
(714) 540-1323

DATAPoint TERMINAL EMULATOR

MICRO-TERM turns your IBM PC into a DATA POINT compatible terminal. Supports parallel printer. Operates at 300 or 1200 baud. Emulates a DATAPOINT 3601 terminal. Complete software and documentation. \$125
SAM WILSON AND ASSOCIATES (DEPT. PC)
 P.O. Box 37065
 Houston, TX 77237
 (713) 270-8450

Software/Training

THE AUTHOR®

COMPUTER AUTHORING SYSTEM. Create your own computer-aided instruction after a day's self-instructional training with THE AUTHOR. Designed for the novice. Create/change lessons easily with clear menus and self-prompting screens. Automatic branching and detailed record keeping. Comprehensive tested documentation.

PHENIX PERFORMANCE SYSTEMS, INC.
324 South Main Street, Suite 1
Stillwater, MN 55082
(612) 430-2980

CLUB NEWS/EDITED BY SUSAN HURLEY

Clubs, bulletin boards, and newsletters enable PC users to capitalize on their fellow users' knowledge.

PC User Groups

This list provides the names and addresses of PC User Groups worldwide. You can check this list to locate other PC aficionados in your area.

ALABAMA

Birmingham IBM PC User Group
Fred Hilbers
P.O. Box 19248
Birmingham, AL 35219
(205) 679-3716

The Greater Gulf Coast Users Group
Jim McGinnis
124 Meadow Wood Loop
Daphne, AL 36528
(205) 826-9558

ALASKA

Anchorage User Group
Mark Bolzern
c/o General Computer Services
213 W. Sixth Ave., #11
Anchorage, AK 99501

ARIZONA

The Phoenix IBM PC Users Group
Fred Lynch
P.O. Box 44218
Phoenix, AZ 85064
(602) 954-7519

IBM PC User Group
Theresa Baudier
P.O. Box 1489
Tucson, AZ 85701
(602) 622-4751

Phoenix IBM-PC Users Group
P.O. Box 44218
Phoenix, AZ 85064
(602) 954-7519

CALIFORNIA

Sacramento IBM PC Users' Group
2844 Wright St., #135
Sacramento, CA 95825

IBM PC Users Group of
Santa Maria
Ray Smyer
575 Ferndale Dr.
Santa Maria, CA 93455
(805) 937-7490

San Diego IBM User Group
Michele Albright
4005 Isle Dr.
Carlsbad, CA 92008
(714) 434-1608

Stanford/Palo Alto User Group
Linda de Sosa
P.O. Box 8292
Stanford, CA 94305
(415) 856-6261

San Diego Computer Society
John Field
1384 Caliente Loop
Chula Vista, CA 92010
(714) 421-9688

IBM PC User Group
Lee Wersel
7255 Orchard Dr.
Gilroy, CA 95020

Beach Cities IBM PC Users Group
Phil Root
8242 Moonfield Dr.
Huntington Beach, CA 92848
(714) 847-6369

MBS SOFTWARE TOOLS

For office, business, club, education and home computer users.

MERGE 'N PRINT \$149

Automatic insertion of variables into your form letters via keyboard input and/or a data file on disk. Use the file utility on the Merge 'n Print disk, our data base and label programs, or your similar programs.* Convenient insertion of boiler plate text. Use with Volkswriter, Wordstar, Easywriter II, Easywriter 1.1, and The Benchmark.† CP/M version also available. 64K and two drives.

The DATAFILERS \$225

A data base program where you can create files of up to 45 fields per record on input screens you design. Customize your reports and labels. Do math between fields. Prescribe validation criteria for each field. Automatic file update, quick list, and default report formats. Extract records on up to five criteria. Easy screen editing and "undo" commands. Assign keywords to your function keys to eliminate redundancy and speed data entry. A real powerhouse with a word processor and Merge 'n Print. 128K and two 320KB drives.

MBS MAILING LABEL PROGRAM \$95

An easy to use mailing label program with 13 pre-defined and two user defined fields. Six sorting combinations for labels and directory listings. Stores up to 1200 records. Creates ASC files. Can be used with Merge 'n Print. 64K and two drives.

Available at your favorite dealer or direct from MBS Software. Dealer inquiries invited.

MBS SOFTWARE

12729 N.E. Hassalo Street
Portland, Oregon 97230
(503) 258-0130 or 761-4137

*Files must be in DIF file format or similar format.
†Registered trademarks of Lifetime Software, MicroPro, Information Unlimited Software, International Business Machines, and Microsoft. CP/M is a trademark of Digital Research.

Ask about our Combination Offer.
We accept VISA and MasterCard.
Phone orders welcome.

VISA



PC will publish a periodic listing of PC user groups and their activities. Drop a line to Club News, PC, One Park Ave., New York, NY 10018. New groups and address changes are shown in boldface.

Modesto-Turlock PC User Group
Liz Leedom
Box 1122
Modesto, CA 95353
(209) 523-4218
(209) 578-2358

IBM Users Group of California
Neil Zachary
P.O. Box 4138
Los Angeles, CA 90028
(213) 937-1314

North Orange County IBM Club
c/o Glenn A. Emigh
1533 Sherwood Village Circle
Placentia, CA 92670
(714) 996-4464

Diablo Valley PC
Aifred Hunt
1415 Oakland Blvd., #101
Walnut Creek, CA 94598
(415) 932-1781

Adventurers Anonymous
Michael Eddy
P.O. Box 8286
Rancho Santa Fe, CA 92067

Cubic Computer Club
Pete Nelson
P.O. Box 80787
San Diego, CA 92138
(714) 453-4953

San Francisco IBM PC User Group
Burt Alcantara
4411 Geary Blvd., #33
San Francisco, CA 94118
(415) 922-4018

U.C. San Francisco User Group
Mark Slichter
UCSF N319Y
San Francisco, CA 94143
(415) 866-2763

PC Club
Max Brioski
1880 California St., #12
San Francisco, CA 94109
(415) 775-8862

Pomona Valley IBM PC User Group
Roy Livingston
10282 Felipe St.
Montclair, CA 91763
(714) 824-9194

Bay Area User Group
Christian Du Lac
P.O. Box 155
San Francisco, CA 94101
(415) 668-4647

Santa Barbara City College Computer
Science Department
Stu Swartz
721 Cliff Dr.
Santa Barbara, CA 93109
(805) 966-2919

Silicon Valley Computer Society
Elvin H. Bollet
P.O. Box 60506
Sunnyvale, CA 94088
(408) 243-1154

San Fernando IBM PC Users Group
David Nussbaum
11556 Riverside Dr., #207
North Hollywood, CA 91602

Peninsular IBM PC Users Group
c/o Friendly Software Corp.
378 El Camino Real
San Carlos, CA 94070

Greater South Bay IBM PC Users Group
P.O. Box 865
Lomita, CA 90717
(213) 325-7533

Thousand Oaks Personal Computer Club
(TOPCC)
c/o ComputerLand
171 E. Thousand Oaks Blvd.
Thousand Oaks, CA 91380

Rancho California Computer Club
P.O. Box 851
Temecula, CA 92390

IBM Personal Computer Club
P.O. Box 90130 #182
San Francisco, CA 94109

Fresno IBM-PC Users Club
R. Belancourt
6750 N. Woodrow Ave.
Fresno, CA 93710

Redding Area PC Society
Ken Daniels
2516 Park Marina Dr., #6
Redding, CA 96001
(916) 243-4111

COLORADO

Deover User Group
Steve Leibson
4040 Greenbriar Blvd.
Boulder, CO 80303
(303) 494-4062

Colorado Springs IBM PC User Group
Cleveland Bell
17665 Shahara Rd.
Monument, CO 80132
(303) 576-2602

CONNECTICUT

SE Connecticut IBM PC Users Group
Pat Ryan
78 Spring Gleo Rd.
Niantic, CT 06357
(203) 739-4855

Connecticut IBM Personal User's Group
Devin Foulger
P.O. Box 291
New Canaan, CT 06840
(203) 744-4002

IBM PC Club
Colette B. Squires
P.O. Box 545
Storrs, CT 06268

Central Connecticut User Group
Rich Paterson
ComputerLand
131 S. Main St.
West Hartford, CT 06110
(203) 581-1448

DELAWARE

PC Professional Users Group
P.O. Box 2350
Wilmington, DE 19899

DISTRICT OF COLUMBIA

IBM PC Special Interest Group
4910 43rd St. N.W.
Washington, DC 20016

CompuServe:
Mike Todd, 70001.1264
Wes Meier, 70215.1017

Financial Institutions Users Group of the
D.C. Metropolitan Area
Gary Elserman
First American Bank, N.A.
740 15th St., N.W.
Washington, D.C. 20005

FLORIDA

IBM Personal Computer Users' Group
Wyatt Bell
The College of Boca Raton
3801 N. Military Trail
Boca Raton, FL 33431

Manasota IBM-PC User's Group
Richard Reyolds
1102 Mallorca Dr.
Bradenton, FL 33529
(813) 792-5400

Northern Florida Amateur Computer Club
Stephen D. LeBar
10921 Kuralet Dr.
Jacksonville, FL 32218

Miami PC User Group
Eddy Cae
6925 S.W. 18 St.
Miami, FL 33155
(305) 282-1891
(305) 940-1755

GEORGIA

Atlanta IBM PC SIG
P.O. Box 76516
Atlanta, GA 30358

Middle Georgia Computer Club
L. Keitt Dantzer
P.O. Box 5705
Macon, GA 31208
(912) 477-7009

HAWAII

Honolulu IBM PC Users Group
Doug Long
P.O. Box 22967
Honolulu, HI 96822

IBM PC User Society
Arthur W. Becker, Public Affairs
Box 591
Pearl City, HI 96782

IDAHO

Idaho PC User Group
Bruce Burns
ComputerLand
687 S. Capitol Blvd.
Boise, ID 83702
(208) 344-5545

ILLINOIS

Autumn Chapter User Group
James L. Szafranski
5195 Castaway Ln.
Barrington, IL 60010
(312) 934-8133

INDIANA

ComputerLand User Group
Susan Shields
ComputerLand
5450 N. Coldwater Rd.
Fort Wayne, IN 46825
(317) 259-7892

IBM PC Users Group, Inc.
P.O. Box 68271
Indianapolis, IN 46268

Northern Indiana IBM PC Users Group
Dr. Terry Alley
316 N. Ironwood Dr.
South Bend, IN 46615
(219) 289-5506

IBM PC User Club
Jo Spangler
Microbase Software, Inc.
P.O. Box 40353
Indianapolis, IN 46240
(317) 877-4304

South Bend PC Club
Thomas R. Lafree
19525 Cleveland Rd.
South Bend, IN 46637
(219) 277-3344

How to teach your kids about the IBM PC.

Now you can teach your children how to use your PC without bogging them down in the user manual...without spending hours demonstrating the simplest functions...and without fear that they'll break your PC because they don't know how to use it properly.

You can do it with the PC edition of *Computers for Kids*—a BASIC learning text whose Sinclair, Apple, and Atari editions have already introduced thousands of children and parents to computers.

Computers for Kids teaches children age 8 and older to write their own programs in less than an hour—without the necessity for previous knowledge of algebra, variables, or computers. And there's a special section that keeps parents and teachers on the same successful command path.

Starting off with an easy-to-understand explanation of how to use the IBM PC, your kids will progress quickly to flow charts and simple print programs...to loops, graphics, and other programming concepts that show the young user how to make the PC do exactly what he wants—in non-technical language that makes life easier for both of you.

Take it from Donald T. Piele, Professor of Mathematics at the University of Wisconsin (Parkside): "*Computers for Kids* is the best book available for introducing children to the IBM PC. And it's a perfect tool for adults who are learning about computers and programming with their children."

So do your children a favor. Do yourself a favor. Order the PC edition of *Computers for Kids* today!



Here are just a few of the useful and exciting topics covered in *Computers for Kids*:

- What is a computer?
- Flowcharting
- Running the IBM PC
- Getting Ready to Program
- PRINT and Variables
- GOTO, INPUT and RND
- IF-THEN and FOR-NEXT
- Graphics Programs
- Sample Programs
- Glossary of Statements and Commands
- Notes for Teachers and Parents

Creative Computing Press

Dept. NA98, 39 East Hanover Avenue, Morris Plains, NJ 07950

Send me _____ *Computers for Kids*, PC edition, at \$5.95 plus \$1.50 postage and handling each. #12K

☐ PAYMENT ENCLOSED \$ _____ Residents of CA, NJ and NY State add applicable sales tax. Outside USA add \$3.00 per order.

☐ CHARGE MY: (Charge and phone order \$10 minimum)
☐ American Express ☐ MasterCard ☐ Visa

Card No. _____ Exp. Date. _____

Signature _____

Mr./Mrs./Ms. _____ (please print full name)

Address _____ Apt. _____

City/State/Zip _____

☐ Send me a FREE Creative Computing Catalog.

The North East Indiana IBM-PC Users Group
c/o George Gynn
9904 Goshen Rd.
FL Wayne, IN 46818
(219) 693-3147

IOWA

Cedar Falls User Group
Lee Ann Moore
Black Hawk Village Shopping Center
Cedar Falls, IA 50613

IBM PC Users Group
P.O. Box 246
Des Moines, IA 50301
Attn: Gary Wilcox
(515) 967-5860

Hawkeye-PC
Ben Blackstock
385 Collins Rd. N.E., #201
Cedar Rapids, IA 52402
(319) 393-5416
Bulletin board:
(319) 363-3314

Quad Cities PC Users Group
Lew Roberts
P.O. Box 464
Bettendorf, IA 52722
(319) 391-9437

KANSAS

Topeka Library User Group
Becky Hinton
Topeka Public Library
515 W. 10th St.
Topeka, KS 66604

Wichita IBM PC Users Group
P.O. Box 16422
Wichita, KS 67218

KENTUCKY

Louisville Users Group
Clyde Jenkins
Capitol Holding Corporation
680 Fourth Ave.
Louisville, KY 40202
(502) 584-8157

Bluegrass IBM PC Users Group
Diane Skoll
Computing Center
Rm. 72 McVey Hall
University of Kentucky
Lexington, KY 40506-0045
(606) 257-2900

LOUISIANA

New Orleans Personal Computer Club
3517 19th St.
Metairie, LA 70002

MARYLAND

I/O News
c/o Data Unlimited
9 Congressional Ct.
Baltimore, MD 21220

Lutherville User Group
Bob Roswell
1516 York Rd.
Lutherville, MD 21093
(301) 337-5555

Baltimore IBM PC Users Group
1910 Trout Farm Rd.
Jarrettsville, MD 21064

Capital User Group, Inc.
Jan Withro
P.O. Box 3169
Gaithersburg, MD 20878
(703) 976-1530

Annapolis PC Users Group
Bill Aherne
1409 Forest Dr.
Annapolis, MD 21403
(301) 268-8779

MASSACHUSETTS

MMS-Forth
Miller Microcomputer Services
61 Lake Shore Rd.
Natick, MA 01760
(617) 653-6136

SIG-66
Joseph Boykin
47-4 Sheridan Dr.
Shrewsbury, MA 01545
(617) 645-1074
(617) 366-8911, ext.-3216

IBM PC Users Group
The Boston Computer Society
P.O. Box 307
Wellesley Hills, MA 02181

Massachusetts IBM PC Users Group
Robert L. Ward
P.O. Box 1014
Heritage Sq.
Belchertown, MA 01007

MICHIGAN

Southwestern Michigan IBM PC Users Group
R. K. Schmitt
2320 Crosswind Dr.
Kalamazoo, MI 49008
(616) 349-5361

Darrell Frappier
South Eastern Michigan Computer Organization IBM SIG
P.O. Box 02426
Detroit, MI 48202
(313) 532-1390

Grosse Pointe IBM PC Users Group
Michael S. Skaff, Ph.D.
565 Saddle Ln.
Grosse Pointe Woods, MI 46236
UNKNOWN PERSONAL COMPUTER ORGANIZATION
Dick Janson
8902 Bath Rd.
Laingsburg, MI 46646
(517) 675-7453

MINNESOTA

Minneapolis User Group
Peter LeNeau
100 N. 6th St.
Minneapolis MN 55403
(612) 339-3233

Twin Cities PC User Group
Jon Dokken
P.O. Box 3163
Minneapolis, MN 55403
(612) 588-2685

MISSOURI

Columbia PC Users Group
Jennifer DuPont
5571 E. Rocky Mountain Ave.
Columbia, MO 65201
(314) 474-1773

IBM PC Users Group of St. Louis
Dave Zumbro
P.O. Box 837
St. Louis, MO 63188

NEW HAMPSHIRE

Portsmouth PC Users Group
Cynthia W. Harriman
57 South St.
Portsmouth, NH 03801
(603) 436-1606

NEW JERSEY

Central Jersey IBM/PC Information Exchange
Howard Dean
P.O. Box 8280
Red Bank, NJ 07701
(202) 842-5900

Personna Computer Association, Inc.
The Int'l Association for Users of the PC
Larry Collison
P.O. Box 759
Point Pleasant, NJ 06742
(201) 640-0300

North Jersey IBM PC Club
Irving Lang
7 West 45th St.
New York, NY 10036

NEW YORK

QNPC

Nathan Cheo
Dept. of Computer Technology
Queensborough Community College
Bayside, NY 11364
(212) 631-6207

East Coast Club

Richard Parker
ComputerLand
79 Westbury Ave.
Carle Place, NY 11514
(516) 742-2262

NYPC: The NY IBM Personal Computer Users Group

Eric A. Jaffe, MD
Cornell University Medical College
1300 York Ave.
New York, NY 10021
(212) 472-6140

The Manhattan IBM Micro Club

Helsine Head
360 Central Park West
New York, NY 10025
(212) 222-9027

IBM PC Users Group of the New York

Amateur Computer Club, Inc.
Jim Creane
P.O. Box 106, Church St. Station
New York, NY 10008
(212) 260-6811

The Long Island Computer Assoc.

Marvin Frelfield
3 Lyndron Ave.
Smithtown, NY 11787
(516) 724-0574

Picture City Personal Computer

Programming Club
Dele Dewey
7284 High View Trail
Victor, NY 14564
(716) 924-5565

The White Plains IBM Personal Computer

User's Group
32 Pine Ridge Rd.
Larchmont, NY 10538
(914) 834-2012

BIBMUG

Buffalo IBM User's Group
P.O. Box 1487
Buffalo, NY 14221

The Northeastern New York

IBM Personal Computer Users Group
Jim Cummins
5 Jacob St.
Ballston Lake, NY 12019
(518) 399-3016

OHIO

Western Reserve IBM PC

Association
Lerry Gavin
ComputerLand
2000 North Road SE
Warren, OH 44484

IBM-PC Users Club

Chuck Herrington
315 Cutler Hall
Ohio University
Athens, OH 45701
(614) 594-6125

Greeter Cleveland PC Users Group

Roy McCartney
30704 Royalview Dr.
Willowick, OH 44094
(216) 944-5173

Akron/Canton PC Users Group

James C. Finucane
10690 Clapsaddle Ave.
Alliance, OH 44601
(216) 935-0252

Acorn: Greeter Cincinnati IBM-PC User's

Group
Randy Corgen
P.O. Box 3087
Cincinnati, OH 45201
(513) 922-2692

OKLAHOMA

Autumn Revolution '81

Den Perry
P.O. Box 55329
Tulsa, OK 74155
(800) 331-2347

IBM PC Users Group.

Roger Baresel
Deloitte Haskins & Sells
700 Fidelity Plaza
Oklahoma City, OK 73102
(405) 232-6191

Tulsa Computer Society, Inc.

P.O. Box 1133
Tulsa, OK 74101

OREGON

PC Users Group

Greg Estes
P.O. Box 5070
Eugene, OR 97405

Portland IBM Personal Computer Club

P.O. Box 2068
Beaverton, OR 97075-2068

Corvallis PC Computer Club

Barry Shane
P.O. Box 1016
Corvallis, OR 97339

PENNSYLVANIA

International Personal Computer Owners

James B. Cookinham
IPCO Inc.
P.O. Box 10426
Pittsburgh, PA 15234
(412) 561-1857
CompuServe: 71545467

**FOR TRS-80 MODELS 1, 3 & 4
IBM PC, XT, AND COMPAQ**

WHICH ONE?

Which microcomputer word processor lets you create and edit without typing, but won't slow down your creative process? Knows when to capitalize the first letter while replacing one phrase with another? Can indent as well as indent? Will do typesetting at your command, even with proportional characters, right justification and tabbed columns? Lets you use the same (extra-capacity) data disks on IBM PC and TRS-80? And eases your learning with common-sense keystrokes, Help menus, good examples and a professionally authored manual?

Hint: It can integrate to communicate from home to office, and will interface with a database for form letters, data tables, and more!

It's the professional's word processor for your IBM PC, Compaq, or TRS-80 Model 1, 3 or 4:

FORTHWRITE

in

mms FORTH

With an unusually powerful set of tools and an unusually easy way of helping you to use them.

All necessary software (FORTHWRITE and the MMSFORTH System), under Personal License for \$425 (IBM PC). Or with FORTHCOM telecommunications module and the DATAHANDLER-PLUS files management system, for \$550 complete. Corporate Site (multiple users) License is available.

May we tell you more?

MILLER MICROCOMPUTER SERVICES
61 Lake Shore Road, Natick, MA 01760
(617) 653-6136

CIRCLE 420 ON READER SERVICE CARD

Philadelphia Area IBM PC Club
Bennett Landsman
2041 Harbour Dr.
Palmyra, NJ 08065
(609) 786-1441

Pennsylvania IBM Group
Ron Kester
1018 Greenlawn Dr.
Pittsburgh, PA 15216
(412) 341-2896

Central Pennsylvania IBM Personal
Computer Association
Chet Smith
215 Computer Building
University Park, PA 16802
(814) 863-0422

RHODE ISLAND

Rhode Island PC Users Group
Mike Mahoney
University of Rhode Island
Tyler Hall
Kingston, RI 02861
(401) 792-2301

TENNESSEE

IBM PC User Group
Ross Burrus
Science Applications, Inc.
Plaza Tower, #601
Oak Ridge, TN 37830
(615) 462-6649

TEXAS

SW-PCUG
Bill Berker
1009 W. Rando Mill Rd., #212
Arlington, TX 76012
(817) 265-0794

The IBM Club
David Andrews
310 Honey Tree Ln.
Austin, TX 78746
(512) 327-0029

PC PLUS/IBM PC-UG
5602 Bennet Avenue
Austin, TX 78751

The BASIC Society
Kathy Ames
Drawer 345099
Dallas, TX 75234
(214) 484-9900

Centex PC Users Group
c/o Charles Weller
325 Explorer
Austin, TX 78734

Houston Area League of PC Users
Rob Taylor
P.O. Box 61001
Houston, TX 77208
(713) 937-3592
ZACHARY*NET
713-933-7353

Dallas-Fort Worth User Club
Samuel P. Cook
309 Lincolnshire
Irving, TX 75061
(214) 253-6979

Texas User Group
Ken Holcombe
178 Tipperary
San Antonio, TX 78223
(512) 333-7163

Southwest IBM PC Users Group
c/o William G. Barker & Associates
1009 West Rando Mill Rd., #212
Arlington, TX 76012

North Texas IBM-PC Users Group
Bill Hood
10400 N. Central Expressway, #210
Dallas, TX 75231
(214) 361-0304

UTAH

Utah ComputerLand
Debby Williams
ComputerLand
161 E. 200 South
Salt Lake City, UT 84111
(801) 364-4416

Utah Blue Chips
John Jaloszynski
P.O. Box 11901
Salt Lake City, UT 84147
(801) 467-5228

VIRGINIA

Capitol PC
Wesley K. Merchant
3277 Victor Cir.
Annadale, VA 22003
(703) 560-0979

The Central Virginia User Group
Webb Blackman, Jr.
P.O. Box 24685
Richmond, VA 23224

IBM PC-Tidewater User Group
Vic Freeman
5237 Dundon Ln.
Virginia Beach, VA 23464

WASHINGTON

The PNW IBM User Group
P.O. Box 3363
Bellevue, WA 98009

BorderLine IBM PC Users Group
Gary B. Rohrbach
3817 Portal Dr.
Bellingham, WA 98226

Borderline IBM PC User's Group
Willard Brown
445 Highland Dr.
Bellingham, WA 98225
(206) 733-4662

WISCONSIN

Madison IBM-PC User's Group
Philip J. Niehoff
P.O. Box 63
Madison, WI 53701
(608) 255-7641

CANADA

Personal Computer Association (PCA)
P.O. Box 251
Ajax, Ontario
L1S 3C3 Canada
Telex: 06-966766

Northern Alberta PC User Group
Jim Laviolette
37 Brunswick Crescent
St. Albert AB
T8N 2K5 Canada
(403) 458-9066

British Columbia User Group
Warren McKay
402-2536 Wark St.
Victoria, BC
V8T 4G8 Canada

Co-operators Microcomputer Club
Adrian Groenendyke
The Co-operators
1920 College Ave.
Regina, Saskatchewan
S4P 1C4 Canada

IBM PC Users Group of Winnipeg
v. BDI Business Development
International
P.O. Box 5, Station A
Winnipeg, Manitoba
R3K 1Z9 Canada

The Personal Computer Club of Toronto
Leon Rudanycz
P.O. Box 266, Station 'A'
Toronto, Ontario
M5W 1B2 Canada

Burl-Oak IBM PC Users' Club
Keith Miller
2068 Salmon Rd.
Oakville, Ontario
L6L 1M3 Canada

Club des utilisateurs d'IBM PC de
Montreal
Bernard Mataligne
5054 rue Fabre
Montreal, P. Que
Canada H2J 3W4
(514) 524-7352

INTERNATIONAL

Okinawa IBM PC Users Group
Major Ron E. Stephens
P.O. Box 395 Butler
FPO Seattle, WA 98773
(206) 835-4664
(206) 637-2620

Unlock the Full Power of Lotus 1·2·3™

With the **KEY II-123**

If you're using Lotus 1-2-3 solely for spreadsheets, you're only getting part of what it has to offer.

What if you want to use 1-2-3 to analyze and graph lists of information such as business expenses, sales data or inventory?

Until now, you needed programming skills and hundreds of keystrokes to process this kind of information with 1-2-3. But no longer! Now you have the **KEYIT-123**.



A powerful set of new programs that you use *with* in your 1-2-3 worksheets, **KEYII-123** makes processing lists of information faster and easier than ever before.

And the **KEYII-123's** simple menus guide you through every step! Unlock the full information management power of 1-2-3. Order the **KEYII-123** today!

Send for the  today.

Name: _____

Company: _____ Title: _____

Address: _____

City: _____ State: _____ Zip: _____

[illegible]

Expiration Date: _____

Signature: _____ *(required for change orders)*

Home Telephone: () _____ Office: () _____

Please send me _____ copies of the KEYII-123 at \$189.00 per copy. (Add \$5.00 per order for shipping and handling. South Carolina residents add 4% sales tax. Master Card and Visa accepted.)

**Lighthouse
Software™**

P.O. Box 15, Hilton Head Island, SC 29938
(803) 785-4040

The **KEYU-123** is a registered trademark of Lighthouse Software Corporation. The **KEYU-123** requires 128K, a graphics monitor and two disk drives. 192K versions for Lotus 1 and 1A are also included. Operates on all 100% IBM PC-compatible computers. Purchase price for The **KEYU-123** is \$189.00. South Carolina residents add 4% sales tax. Add \$5.00 per copy for shipping and handling. To order, call (803) 785-4949. MasterCard and Visa accepted. Lotus and 1-2-3 are trademarks of Lotus Development Corporation. IBM PC is a trademark of IBM Corporation. Dealer inquiries invited.

CIRCLE 296 ON READER SERVICE CARD

SPINWRITER INTR

Now you have a choice of fully compatible Spinwriters for your IBM PC and XT.

First, a few words about the original, the Spinwriter 3550.

It was the first and only totally compatible letter-quality printer for the IBM PC. It plugs directly into the IBM PC and works with every piece of IBM PC software, as well as all popular third-party application packages, such as WORDSTAR™, WORDPLUS™, VOLKSWRITER™, VISIWORD™, MULTIMATE™, BPS GRAPHICS™, LOTUS™ 1-2-3™, and VISICALC™.

It even looks like it was made for the IBM. Now, as good as the Spinwriter

3550 is, we recognize that a single printer can't take care of every business or professional office need. So we've added another IBM PC compatible Spinwriter: The 2050.



NEC MODELS OFFER SPEEDS OF 200 AND 350 WORDS PER MINUTE

The new 2050 has a printing speed of 200 words per minute. And while it costs less, the print quality is still impeccable. So if low-volume letter-quality printing is what you need, the 2050 is your answer. 60 different print thimbles let your IBM PC look its best.

One of the things that gives our Spinwriter capabilities you can't even get on other printers is our unique "thimble." Each thimble holds up

to 128 characters. You can even have two different type faces on one thimble or print multiple languages from a single thimble. Think of how handy



OUR UNIQUE "THIMBLE" PRINTER OFFERS UP TO 128 CHARACTERS AND HIGHER QUALITY PRINTING.

Spinwriter is a trademark of NEC Corp. IBM is a trademark of International Business Machines Corp. WORDSTAR is a trademark of WordPerfect Corp. WORDPLUS is a trademark of Microsoft Corporation. VISIWORD is a trademark of VisiCorp. MULTIMATE is a trademark of Multimate Corp. LOTUS 1-2-3 and VISICALC are trademarks of Lotus Development Corp. BPS GRAPHICS is a trademark of Business & Professional Software, Inc. LOTUS and 1-2-3 are trademarks of Lotus Development Corp.

ODUCES A SPINOFF.

that would be if your business is international.

On the other hand if you have special printing needs, you can opt for a full alphabet plus numbers, sub- and superscripting and scientific and arithmetic symbols.

Incidentally, for all their versatility, our inexpensive

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

АБВГДЕЖЗИЙКЛМНОПРСТУФХ
АБВГДЕЖЗИЙКЛМНОПРСТУВ

ABCDEFGHIJKLMNOPQRSTUVWXYZ
 Δ→R≡³ρ/÷⁸&\≡/ⁿ⁹⁰¹⁴α²⁷\₂≥⁶†

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

ABCDEFGHIJKLMNOPQRSTUVWXYZ
"£|". '5~ft0z"1000*jj800A"ac

SPINWRITER OFFERS OVER 60 DIFFERENT TYPE FACES.

thimbles last for over 30 million impressions.

So it won't end up costing you a fortune to look like a million.

**No matter what
form your
business takes,
Spinwriter can
handle it.**

A Spinwriter can actually

help you put your communications in better shape. It can use any of our nine interchangeable forms handling options. And they can all be easily installed and changed by the operator.

Want to dash off a few hundred original letters to your customers? Our sheet-feeder is just the ticket. It will print on your letterhead and second sheet or envelope.

Standard features include continuous forms handlers that take paper up to 16 inches wide, variable size forms, and multi-part forms.

Spinwriters have a hard-earned reputation for reliability.

Spinwriters hold the industry record for mean-time-between-failure. Over 3,000 hours. Which, in terms of average personal computer usage, adds up to more than two trouble-free years.

One reason for Spinwriters' staying power is the fact that we manufacture every major component. It also helps explain why NEC Information

Systems is the number one supplier of letter-quality printers to PC users in America. Of course, someday you may need a little service. If you do, it's nearby. We have a large group of

SPINWRITER CAN OPTIMIZE YOUR
IBM PC CAPABILITIES.

NEC-trained professionals all around the country. It's also quick. Because of our modular design, normal repairs take less than 20 minutes.



9 DIFFERENT NEC-BUILT FORMS
HANDLERS AUTOMATICALLY FEED
ANY OFFICE FORM YOU HAVE.

You'll find Spinwriters at participating ComputerLand stores, Sears Business Systems Centers, IBM Product Centers nationwide, Entré Computer Centers and authorized NEC Spinwriter distributors. Or call 800-343-4418 for more information. And find out why more and more IBM PC users are saying, "NEC and me."

NEC AND ME

NEC INFORMATION
SYSTEMS, INC.



PRO-MODEM 1200



It's about time.

Time for your computer to make the telephone connection — with an intelligent, full 212A 300/1200 baud modem — with a real time clock/calendar — and with the capability to expand into a complete telecommunications system. It's time for PRO-MODEM 1200. Much more than just a phone modem.

When you're on-line, time is money. PRO-MODEM telecommunication systems help you save. By monitoring the duration and cost of your phone calls. And by sending and receiving messages, unattended, at preset times when the rates are lower. . . with or without your computer.

Compare the \$495 PRO-MODEM 1200 with any other modem on the market. For example, you'd have to buy both the Hayes Smartmodem 1200 plus their Chronograph for about \$950 to get a modem with time base.

PRO-MODEM 1200 is easy to use. A convenient "Help" command displays the Menu of operating command choices for quick reference whenever there's a question about what to do next. Extensive internal and remote self-diagnostics assure that the system is operating properly. Some of the other standard features include Auto Answer, Touch Tone and Pulse Dialing, and Programmable Intelligent Dialing.

PRO-MODEM does more. It lets you build a full telecommunications system with features like Auto Dialer, Incoming and Outgoing Message Buffering, Business/Personal Phone Directory, Programmable Operating Instructions, a 12-Character Alpha-Numeric Time and Message Display, and versatile PRO-COM Software. PRO-MODEM commands are Hayes compatible so you can use most existing telecommunications software without modification.

There's much more to the PRO-MODEM story. See your local dealer for complete details. He'll show you how to save time. And money.

Prometheus Products, Inc., 45277 Fremont Blvd., Fremont CA 94538, (415) 490-2370



PROMETHEUS

PC readers help each other by passing along their tips and tales of tribulation.

User-To-User



Let Us Now Give Thanks...

The enclosed program (see Figure 1) is for dull people who like to show off their computers.

Most application programs are extremely boring to the uninitiated. A snazzy word processor program may be fascinating to the writer but is totally uninteresting to everyone else. The same goes for spreadsheets, accounting, and engineering programs. Playing games is about the only application that the average person can quickly relate to. And dull people don't have any games.

I wrote this program after being asked to help prepare a turkey for dinner. It originally was about five lines long, but after lunch I sort of got carried away as you can see.

The expanded version took about half an hour to write. This is a classic case of computer overkill. The average person might spend a total of 5 minutes during his entire life performing the same amount of work.

However, I have found that while absolutely no one is interested in my manufacturing labor distribution program or my casework cut listing and cost factoring program, when I demonstrate TurkeyCalc

the crowd is fully appreciative every time.

And it isn't an idle waste of time. It does a job that most people need to have done every now and then.

Not knowing what else to do with it, I am sending it to you.

Carl W. Spencer
Riverside, California

Overdone is definitely the word for this one. Before someone tells us to get stuffed

or, worse, gives us the bird, we have to say that we just didn't have the heart to kill this turkey.

Disagreement over DEBUG

I have just finished reading "User-To-User" in the August 1983 issue of your magazine. To my amazement, you missed the point of "We Interrupt This Program..." What you obviously do not realize is that functionally correct software products, similar to DEBUG, have been avail-

Figure 1: The TurkeyCalc program by Carl Spencer.

```
2 * TurkeyCalc
3 * Copyright (C) 1983 Carl W. Spencer
4
5 * Saved as "TURKEYCALC" (Figure cooking time for turkeys)
6
7 ON ERROR GOTO 2000
8
9
100 * ***** VARIABLE NAMES *****
110
120 * W.....Weight of the bird
130 * X.....Cooking time (decimal)
140 * Y.....Extra minutes (decimal)
150 * Z.....Extra minutes (truncated)
160
1000 * ***** TITLE SCREEN *****
1010
1020 CLS: KEY OFF: HOME 1730
1030
1040 * ***** OPENING TUNE *****
1050
1060 PLAY "PB 1180 G2 LB: 8088F6.W0.5: G3: CC: G2: 8.A0..."
1070 PLAY "8FFFF.FEED.E0.D0.E0..0..."
1080
1090 * ***** MAIN INPUT *****
1100
1110 CLS: LOCATE 1,5: COLOR 15: PRINT "TurkeyCalc";
1120 COLOR 7: PRINT TAB(41) "(C) Copyright 1983 Carl W. Spencer"
```

Figure 1 continues on next page.

Expandable Memory for the IBM Personal Computer

	Value	Sale
64K	\$199.99*	\$159.00
128K	209.99*	179.00
256K	328.99*	299.00

* Bonus

Includes 4-function
calculator

Software to add-sub-
mult-div-%

Will print Journal or
Printer

Included with all RAM
Boards until 1/1/84

If Separately Purchased
\$29.99

Parity checked—fully tested
—one year warranty RAM
locations socketed-No
Proms or PLA

To order:

PC Technologies
3714 A Silver Star Road
Orlando, FL 32808

800-874-7062 or
305-299-1644

Figure 1 continued.

```

1130 FOR N=1 TO 80: PRINT CHR$(194);
1140 NEXT
1150 PRINT:PRINT:PRINT TAB(5) "This progree calculates the proper cooking time f
or any turkey you may have."
1160 INPUT " " Now much does your bird weigh (in pound):"W
1170 IF W<16 THEN 1410
1180 IF W>16 THEN 1230
1190
1200 " ***** PROCESSING BIG BIRDS *****
1210
1220 HWS="breast side down," : TEMP="275"
1230 IF W>20 THEN 1240 ELSE 1330
1240 FOR N=2000 TO 4000 STEP 20: "wolf whistle
1250 SOUND N,.1
1260 NEXT
1270 FOR N=1 TO 150: NEXT
1280 FOR N=2000 TO 4000 STEP 40
1290 SOUND N,.1
1300 NEXT
1310 FOR N=4000 TO 2000 STEP -40
1320 SOUND N,.1
1330 NEXT
1340 COLOR 15: LOCATE 7,54: PRINT "What a bird!": COLOR 7
1350 X=(H*22)/60
1360 Y=(X-INT(X))/60
1370 Z=INT(Y): GOSUB 1480: GOTO 1600
1380
1390 " ***** LITTLE BIRDS *****
1400
1410 HWS="breast side up," : TEMP="325": IF W<16 THEN LOCATE 9,5: COLOR 15: PRIN
T "Let the poor critter grow up!": COLOR 7: GOTO 1600
1420 X=(H*22)/60
1430 Y=(X-INT(X))/60
1440 Z=INT(Y)+1: GOSUB 1480: GOTO 1600
1450
1460 " ***** PRINT ANSWER TO SCREEN *****
1470
1480 LOCATE 9,5: PRINT "Cook the bird for:"
1490 COLOR 15: PRINT INT(X) "hours"
1500 COLOR 7: PRINT " and "
1510 COLOR 15: PRINT Z "minutes," :
1520 COLOR 7: PRINT HWS
1530 PRINT: PRINT TAB(5) "Temperature: " TEMP: CHR$(240)
1540 PRINT: PRINT TAB(5) "Note: Cooking time is only an estimate. The best way
to know if you"
1550 PRINT TAB(12) "turkey is properly roasted is to have placed a meat thermos
ter"
1560 PRINT TAB(12) "in the thigh muscle. It should register 185" CHR$(240) " wh
en the bird is done."
1570
1580 " ***** CHECK ANOTHER TURKEY? *****
1590
1600 LOCATE 25,5: PRINT "Would you like to check out another turkey (y/n)?":
1610 LOCATE ,,1: READ INPUT$(1)
1620 IF M$="Y" OR M$="y" THEN CLS: GOTO 1640
1630 IF M$="N" OR M$="n" THEN 1930
1640 GOTO 1600
1650
1660 " ***** ERROR MESSAGE CLEARING SUBROUTINE *****
1670
1680 LOCATE 25,5: PRINT "
"
1690 RETURN
1700
1710 " ***** COPYRIGHT SCREEN SUBROUTINE *****
1720
1730 LOCATE 5,20: FOR N=1 TO 42: PRINT CHR$(194);
1740 NEXT
1750 LOCATE 10,20: FOR N=1 TO 42: PRINT CHR$(194);
1760 NEXT
1770 LOCATE 5,19: PRINT CHR$(218): LOCATE 5,42: PRINT CHR$(191): LOCATE 10,19: P
RINT CHR$(191): LOCATE 10,42: PRINT CHR$(217)
1780 FOR N=1 TO 9
1790 LOCATE M,: PRINT TAB(19) CHR$(179): SPC(42) CHR$(179)
1800 NEXT
1810 LOCATE 4,33: PRINT "> TurkeyCalc <"
1820 PRINT
1830 LOCATE 8,38: PRINT "free"
1840 LOCATE 9,33: PRINT "Carl M. Spencer"
1850 LOCATE 12,24: PRINT "for the IBM Personal Computer"
1860 LOCATE 22,14: FOR N=1 TO 80: PRINT CHR$(194);
1870 NEXT
1880 PRINT SPC(123) "Copyright (C) 1983 Carl M. Spencer"
1890 RETURN
1900
1910 " ***** END PROGRAM *****
1920
1930 PLAY "M 1120 G2 L8: G888F8,88,.8: G3: C3: G2: 8.AB...."
1940 PLAY "B: G3: C.C: G2: 8.AB.,EC.,DC.,GE.,DC...."
1950 CLS: GOSUB 1720
1960 " ending instructions
1970 LOCATE 15,15: PRINT "If session is finished, remove diskettes from drives."

1980 LOCATE 17,18: PRINT "When you are ready to run another program insert"
1990 PRINT SPC(111) "appropriate DOS System Diskette in Drive A and press ENTER":

2000 INPUT "",M$
2010 CLS: SYSTEM
2020
2030 " ***** ERROR RECOVERY ROUTINES *****
2040
2050 IF ERR=73 THEN 2040 ELSE END
2060 CLS: LOCATE 25,5: BEEP: COLOR 15: PRINT "Please load BASIC before running
this program. (ENTER) to go to DOS."
2070 M$=INPUT$(1): GOSUB 1680: COLOR 7: SYSTEM
2080

```

able for nearly every computer ever manufactured. A statement that "the PC is not designed to be a logic analyzer..." conveys your total ignorance of the fact that the developers (we all know who I mean) of IBM PC's DEBUG really blew it. I quote from the IBM PC Pascal manual, page 1-11, "IBM Personal Computer Pascal is more than a tool; it is a tool maker, designed for writing smart programs that make our computer easier to use and more accessible to people." The correlation may not be immediately obvious, but consider how many computer professionals use DEBUG. If the number of individual users is small, why did IBM provide a software development tool in their standard operating system? Or for that matter, why did they decide to provide a development tool with bugs and then pass the buck to a salesman uneducated in the state of the art?

To all those readers who could care less about development tools: You may have spent upwards of \$500 on a piece of software that cannot be completely functionally tested.

Timothy S. Anderson
St. Michael, Minnesota

You may not believe it, but we really are in agreement on DEBUG. I have used enough similar programs on other computers to appreciate how they should work. IBM's (actually Microsoft's) lockadoisical attitude toward proper operation with the PC's interrupt structure is shameful. Even if it single-stepped perfectly, it still would be a poor choice against a logic analyzer for debugging real-time or interrupt-driven activities.

More dBASE II Color Mods

I have some comments on "dBrightness in dBase," ("User-To-User," PC, Volume 2 Number 2). There have been many references to using POKE 1047.n in the PC version of dBASE II to change the video attributes.

bute.

However, the byte at 1047 affects only the video attributes of characters displayed with the GET clause of the @... SAY command. I desperately wanted to control the appearance of all characters on the screen. With a little snooping, I discovered that location 1062 controls the attributes of what appears from the prompting portion of the @ SAY command. For example:

```
POKE 1062,15
@ 5,2 SAY 'This should be
high intensity.'
```

Programmers are well advised to be wary of undocumented features. All my dBASE II programs use memory variables for the POKE addresses and attribute codes; if a new version of dBASE II has different locations, or if I want to change colors, only a few statements need to be updated.

I also wanted attribute control for the displays from the question (?), ACCEPT, and INPUT commands. These commands apparently write to the screen via standard operating system calls. With DOS 2.0, I use the ANSI.SYS screen control driver (see pages 13-2 and 13-8 in the DOS 2.0 manual). It is easy to issue escape sequences from dBASE II to set the "graphics rendition." See Figure 2 for an example.

This program enables you to make very attractive screens. But why not stick with the @ command? It seems that the @ SAY command would not correctly display some of my memory variables containing long strings of special characters for drawing boxes on the screen.

One undesirable consequence in using the ANSI escapes sequences to set the video attributes is this: When the user enters data in a GET field, the characters entered have the attribute set by the last escape sequence, not that set by POKE 1047. For example, most of my GET fields are highlighted and underscored with POKE 1047,9, so I also issue a ? Bright+Under

TAROT-VIEW

Let the Computer guide your future. Romance, money, business, life.

Now make really intelligent business decisions.



*Standard 78 card deck.
Divination in accord with
recognized authorities.*

*Runs on PC-DOS, mono or
color display-128K \$39.99*

To order:

PC Technologies
3714 A Silver Star Road
Orlando, FL 32808

**800-874-7062 or
305-299-1644**

Figure 2: Christopher Sacksteder's program enables you to make attractive screens in dBase II.

```
* Assign string to set bright, normal, and underscored
* characters:
*
STORE chr(27) + "[1m" TO Bright
STORE chr(27) + "[0m" TO Normal
STORE chr(27) + "[4m" TO Under
? 'This is normal '+Bright+'and this is highlighted.'
? Under+'This is underscored and highlighted.'
? Normal+Under+'This is underscored and normal intensity.'
? Normal+'This is normal text.'
```

Let's Talk GrafTalk™

GrafTalk is business graphics software that works as hard for your business as you do.

You can use GrafTalk the way you'd like

GrafTalk is flexible in accepting commands. You can type English-language commands interactively, run commands from disk files, or use GrafTalk's menus if you prefer.

GrafTalk has all the graphics features you need

Choose from stacked, percentage, clustered, or floating bars; exploded pies, line plots, scatter diagrams and combinations plots. And adjust their style to fit your needs.

GrafTalk has lots of extras

These include a built-in text editor, a mini-spread-sheet, a feature for creating your own menus, the ability to save and edit your graphs and the capacity to interface with many other programs.

GrafTalk has good, clear documentation

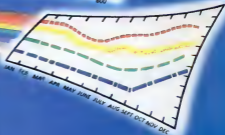
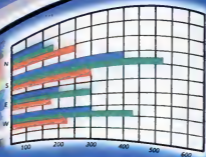
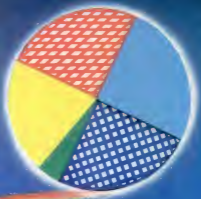
With our color tutorial and full Reference Manual, you can begin making useful graphs right away.

Chances are it works with the hardware you want

GrafTalk runs on CP/M systems, the IBM-PC and other 16 bit systems and with so many screens, plotters and printers that we don't have room to list them all.

Call or write to put GrafTalk to work for you.

GrafTalk is a trademark of Redding Group Inc. CP/M is a registered trademark of Digital Research.



609 Main Street, Ridgefield, CT 06877 Telex 643351
2730 High Ridge Rd, Stamford, CT 06903 203/329-8874

CIRCLE 368 ON READER SERVICE CARD

before the READ (assuming the Bright and Under memory variables were previously set as shown above).

This may seem like a lot of trouble, but it greatly enhances the appearance of dBASE II screens, and this lazy programmer decided it was worth the few extra lines of code. I was wishing for a new version of dBASE II for the IBM PC that would make changing screen attributes easier, perhaps another keyword within the @ command and/or another SET option. However, a list of enhancements in version 2.4 has no mention of this kind of feature.

Christopher J. Sackstader
State College, Pennsylvania

Chris' point on using variable names for poke addresses and attributes is well taken. Thanks for the illumination.

The Price is Right on DISK-CAT

DISK-CAT is a disk file cataloging program that was written for a PC users group in

Houston to maintain the group's software library.

Its machine language code reads a disk directory, getting each file's name, creation date, and file size. Another routine in the program allows you to add a one- or two-word file classification and a longer file description. The file information is stored in a database that can be sorted, edited, and printed by DISK-CAT.

Another feature allows putting a file on each disk containing the information in the catalog—name, classification, description, etc.—for just the files on that disk.

DISK-CAT is available free of charge to any user group that sends a formatted disk and a postage-paid, self-addressed mailer to Nelson Ford, P.O. Box 61565, Houston, TX 77208.

Nelson Ford
Houston, Texas

We're always glad to pass the word on user group software sharing. Wont this pro-

gram for yourself? Join one of the user groups listed in PC's "Club News" dept.

Happier Returns

I'm responding to a question in "PCTutor" (see "Unhappy Returns," PC Volume 2 Number 2) concerning the use of an NEC PC-8023 printer.

According to the manual for the PC-8023A-C dot-matrix printer, I changed the switch "SW1-7" from the factory's setting (open) to closed. This has provided totally satisfactory performance for all printer output—PrtSc included. No other DIP switches related to carriage returns or line feeds should be changed since this can affect proper operation. Hope this helps.

Steve Smith
San Francisco, California

Another Random Number Method

Here's another, possibly better, way of creating a "random random" number series. Include in your BASIC program:

Tektronix 40XX Terminal Emulation

EMU-TEK™ IS NOW AVAILABLE FOR IBM PC, XT, AND MOST COMPATIBLES

- Access powerful mainframe graphics using:
 - PLOT 10 (trademark of TEKTRONIX, Inc.)
 - DISPLA (registered trademark of ISSCO)
 - SAS/GRAPH (trademark of SAS INSTITUTE, Inc.)
 - DARC (available from QUESTEL, Inc.)
 - and most similar packages and services.
- Upgrade from dim storage tubes to bright raster scan technology, with complete software compatibility.
- Increase versatility with options such as:
 - High resolution board support (HERCULES, CSI, AMDEK, TECMAR, etc.)
 - Local pen-plotter support (HP, AMDEK, etc.)
 - Hard copy on EPSON or IBM matrix printer
 - LIGHT PEN for graphic input
 - Advanced communications program features
- Other terminal emulations, including:
 - VT100 (trademark Digital Equipment Corp.)
 - ADM3 (trademark Lear Siegler, Inc.)
 - RETRO-GRAPHICS (trademark Digital Engineering, Inc.)

• 30 DAY NO-RISK TRIAL PRIVILEGE.

Call or write us, or see your participating dealer.



FTG
DATA SYSTEMS

FTG will soon become PC INNOVATIONS

10001 Dale St./P.O. Box 615
San Jose, CA 95060
(714) 995-3900

THE LIGHT PEN FOR YOUR PC IS NOW EVEN BETTER!



- New photo-optical push-tip switch for super reliability.
- **30 DAY NO-RISK TRIAL PRIVILEGE**, and **TWO** year limited warranty.
- Ideal keyboard alternative for INTERACTIVE GRAPHICS, MENU SELECTION, EDUCATIONAL PROGRAMS, and just plain fun.
- Compatible with a growing library of software:
 - PC-DRAW (trademark of MICROGRAFX)
 - MICRO-CAD (trademark of COMPUTER AIDED DESIGN)
 - PIXEL PICKER (trademark of FTG DATA SYSTEMS)
 - and much much more. (Complete list on request).
- Very high performance and reliability for just \$159.95. (Optional three diskette software package is just \$39.95)
- Ultra-deluxe version soon available (\$295.00).
- Got another pen?? Ask about our trade-in special.



FTG
DATA SYSTEMS

FTG will soon become PC INNOVATIONS

10001 Dale St./P.O. Box 615
San Jose, CA 95060
(714) 995-3900

CIRCLE 250 ON READER SERVICE CARD

JUKI 6100 LETTER QUALITY PRINTER



\$499.

- 18 cps
- Word processing and graphic functions
- Proportional spacing control
- Uses IBM Selectric ribbons
- Compatible with Kaypro, IBM, Apple, Osborne, and others.

Free shipping in U.S.

**COMPUTERS
and more**

3420 University Ave., To Order
San Diego, Ca. 92104 (619) 291-1442

ADVERTISE!

Microsystems Mart ads really
generates sales \$205 each.
6x \$185 each, 12x \$170 each.
Send ad and payment to:

microsystems

CLASSIFIED AD DEPT
ONE PARK AVENUE
NEW YORK, NY 10016

OR CALL COLLECT:
LOIS PRICE (212) 725-4215

\$ SAVE \$\$\$\$ SAVE \$\$\$\$ SAVE \$

**.. MAKE MONEY ..
.. WITH YOUR ..
.. MICRO NOW!!!! ..**

There's probably a gold mine in your own kitchen drawer loaded with unused food coupons. That's right, coupons! Complete system for maximizing the return on your Micro by utilizing a creative methodology that combines a manual and systems approach in BASIC by maintaining and evaluating food coupon activities utilizing tips and techniques that will pay for this package many times over. At this very low price of \$39 you can hardly afford to be without it. Make that Micro begin paying for itself now! Includes complete programs, listings, and documentation.

Send \$39 to:
Sensible Systems
P.O. Box 296
Richardson, TX 75081
(specify operating system
and floppy type)

```
500      RANDOMIZE
VAL(MID$(TIME$,4,2))
*100+VAL(MID$(TIME$,7,2))
```

This statement uses the time of day as the seed for the BASIC random number generator. In principle, it is no different from the counter suggested by Paul Burck in the July, 1983 issue; it simply uses the PC's internal clock as the counter. The advantage is that only a single program line is required and no variables are defined.

Programs that are often booted and automatically started may not work well with this method if the RANDOMIZE statement is too close to the top of the program, particularly when they are run on PCs without a battery-operated clock. This is because, in the absence of a battery-operated clock, the PC's time of day is reset every time the system is booted. The value of the TIME function, therefore, will tend to be the same number from run to run unless the RANDOMIZE function appears after an on-screen question asked of the user.

Jan B. Young
Port Washington, Wisconsin

Here is another entry in our continuing saga of ways to seed the random number generator in BASIC. It works; do with it what you will.

Program Performs Print Screen
I have discovered an interesting tip to pass along to your readers.

Using IBM PC BASIC 2.00, it is possible to duplicate the function of the Ctrl-PrSc key combination under program control.

To turn ON echo of screen output to the printer:

```
DEF SEG : POKE &H758, &HFF
```

To turn this printer echo OFF:

```
DEF SEG : POKE &H758, 0
```

Ken Snapp
Denver, Colorado

Sorry, all you PC-DOS 1.1 users. This only works with BASIC 2.00 under PC-DOS 2.0. Is that good enough to make you switch?

Toggle Ctrl and ALT

In "PC-Tutor" in the June issue of PC, there was a letter submitted by Dal Vordahl, a handicapped person who cannot use the PC's keyboard because he can only type with one hand. He requires the control and alt keys to "toggle" as NumLock and Caps Lock do. My partner and I had just started our own small software business when we saw this letter and considering that a single assembly language pro-

Figure 3: Karl Mueller's program to convert Ctrl and Alt to toggle keys.

LOCK.BAS - PROGRAM TO CONVERT CONTROL AND ALT TO TOGGLE KEYS

```
10 *      LOCK.BAS
20 *      Produced for Dal Vordahl by M+M Software
30 *      program written by Karl Mueller
40 *
100 CLS:PRINT"Working...."
110 FOR A=1 TO 109
120   READ B
130   Q=Q+B
140 NEXT A
150 IF Q=11567 THEN 180
160 BEEP:PRINT"Bad Data - Check Your Typing"
170 PRINT:END
180 OPEN"LOCK.COM" AS 1 LEN=1
190 FIELD #1 AS A#
200 RESTORE
210 FOR A=1 TO 109
220   READ B
230   LSET A#=CHR$(B)
240   PUT 1,A
250 NEXT A
260 CLOSE:PRINT"LOCK.COM created"
270 *
280 DATA 235,94,144,251,156,14,46,235,54,93,1,80,83,81,82,86,87,30,6,252
290 DATA 184,64,0,142,216,228,96,80,228,97,138,224,12,128,230,97,134,224
300 DATA 230,97,88,138,224,60,29,116,35,60,56,117,18,128,54,23,0,8,246
310 DATA 6,23,0,8,117,6,184,184,184,235,9,144,60,184,116,14,60,157,116
320 DATA 10,234,168,233,0,240,128,54,23,0,4,234,94,234,0,240,207,92,1
330 DATA 0,186,3,1,184,9,37,205,33,186,96,1,205,39
```

gram could mean such a great deal to a person, we set out to accomplish the task. Figure 3 is a BASIC program, which will create a .COM file to convert the Ctrl and Alt

keys into toggle keys (see Figure 4).

After the BASIC program LOCK.BAS has finished running, there will be a new file on your diskette: LOCK.COM. When

you boot up into DOS, make sure this file is on your diskette and just type LOCK (or include LOCK as a line in your AUTOEXEC.BAT file). When the program is finished, Ctrl and Alt behave like toggle keys until the system is rebooted.

Note: This program takes up a small amount of memory—less than one half K. However, if you already have the basic memory requirements for some programs (such as WordStar), they will not run until you install more memory or reboot without using LOCK. Note also that since this program creates a new keyboard interrupt, it is not compatible with other programs which do the same (Prokey, for example) unless modified. If you have a problem like this, send both programs to M+M Software, Sky Oak Dr., Bradford Woods, PA 15015, and we will make them compatible.

We wish Dal the best of luck and hope he finds this program useful. Please place it where he may see and use it.

Karl Mueller
Bradford Woods, Pennsylvania

Thank you for this program. It will open up new PC vistas to many people. We appreciate and applaud your humanitarian interests. Just a note of caution: While this program works well for PC-DOS 1.1, it does not work under PC-DOS 2.0 or, for that matter, on PC-XT or all probably due to differences in the ROM.

Share Your Discoveries

Tell the world about your latest discovery through User-to-User. You'll encourage others to return the favor, and we'll pay you \$25 for your trouble. Please use double spacing when writing for this department. Mail your contributions to: User-to-User, PC Magazine, One Park Avenue, New York, NY 10016.

Note: In the interest of accuracy, we will gladly accept—even encourage—submissions containing program listings on a disk. PC will return or replace a disk at your request. If you send a disk, please include a printout of your submission to ensure against damage in transit.

Furthermore, all programs that create .COM or BSAVE'd executable code from decimal or hex data must be accompanied by the source code in assembly language. This, too, will reduce errors and will be instructive to readers of User-to-User. */PC*

Figure 4: The program execution of Karl Mueller's toggle for Ctrl and Alt

[illegible]



PC™ MAGAZINE FREE INFORMATION



Learning more about a product that's advertised or mentioned in an article in this month's issue is as simple as 1-2-3. And absolutely free.

1

Print or type your name and address on the attached card. Use only one card per person.

2

Circle the numbers on the card that correspond to the numbers at the bottom of the advertisements or articles for which you want more information. Key numbers for advertised products also appear in the Advertisers' Index.)

3

Simply mail the card, and the literature will be mailed to you free of charge by the manufacturer.

This address is for our "Free Information Service" only. All other inquiries are to be directed to PC Magazine, the Independent Guide to Personal Computers, One Park Avenue, New York, N.Y. 10016

PC™ MAGAZINE

101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131
132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162
163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193
194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224
225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255
256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286
287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317
318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348
349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379
380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410
411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441
442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472
473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503
504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534
535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565
566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596
597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627
628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658
659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689
690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720
721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 478 749 750
751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782
783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800

PLEASE PRINT CLEARLY-Use only one card per person

NAME _____ PHONE # (_____) _____

COMPANY _____

ADDRESS _____ APT _____

CITY _____ STATE _____ ZIP _____

(Zip code must be included to insure delivery) Void after January 31, 1984

PC11834

4 ☐ Send me one year of PC Magazine for \$21.97 and bill me. (Full subscription price \$26.97.)

PC™ MAGAZINE

101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131
132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162
163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193
194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224
225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255
256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286
287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317
318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348
349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379
380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410
411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441
442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472
473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503
504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534
535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565
566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596
597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627
628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658
659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689
690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720
721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 478 749 750
751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782
783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800

PLEASE PRINT CLEARLY-Use only one card per person

NAME _____ PHONE # (_____) _____

COMPANY _____

ADDRESS _____ APT _____

CITY _____ STATE _____ ZIP _____

(Zip code must be included to insure delivery) Void after January 31, 1984

PC11833

4 ☐ Send me one year of PC Magazine for \$21.97 and bill me. (Full subscription price \$26.97.)

FREE FREE FREE FREE FREE

PUT STAMP HERE
THE POST OFFICE
WILL NOT DELIVER
MAIL WITHOUT
POSTAGE



PC™ Magazine
P.O. Box 13848
Philadelphia, PA 19101



The Independent Guide to
IBM Personal Computers

FREE INFORMATION

about the products
and services
advertised in this
issue of



PUT STAMP HERE
THE POST OFFICE
WILL NOT DELIVER
MAIL WITHOUT
POSTAGE



PC™ Magazine
P.O. Box 13848
Philadelphia, PA 19101



The Independent Guide to
IBM Personal Computers

PC Product Index

RS#	PRODUCT	ADVERTISER	PAGE#	RS#	PRODUCT	ADVERTISER	PAGE#
DISK OPERATING SYSTEMS				GRAPHICS SOFTWARE			
391	Cohesent	Mark Williams	500	203	Autocad	Digital Control Systems	105
*	MemoryShift	North American Business Systems	Cover 3	221	Chartmaster	Decision Resources	10
715	Thoroughbred Software	SMC Software Systems	415	492	Crestbase	PC Software	55
491	Operating Sys. Exp.	Tridian Computer	374	228	Energraphics	Electronics Research Inc.	188
437	PC-GT	Sierra Data Sciences	542	483	Executive Picture Show	PC Software	31
ACCOUNTING SOFTWARE				272	Fast Graph	Innovative Software	355
INTEGRATED ACCOUNTING PACKAGES				363	Graphix	Redding Group	726
559	Account Master	Small Business Systems Group	512	364	Macrograph	Mirror Images	321
173	Solomon General Ledger	Computech Group Inc.	496	484	PC Crypex	PC Software	53
251	Assistant Controller	Lake Avenue Software	211	158	PC Draw	Micrograph	543
159	AMI Business Systems	Automation Management Inc.	444	595	PC World	United Software of America	377
163	Business Acct'g Pkgs	Bitrol Information System	244	325	SW Plots	Onscreen	395
282	Cyna	Logicsoft	266-269	328	Telegraph	Microtaur	338
432	Desktop Accountant	Rosky Mountain Software Systems	363	309	VCE Execution	Prattville Hall	375-379
229	Jewel Software	Heritage	80-81	380	Visual 5	Pyral Visuals	249
143	Network Hardware	Cygnat Technology Inc.	115-117				
380	Practical Accountant	Softlink	344				
*	RealWorld Business Software	MBSI	5				
*	Super Calc	Sorcin Corporation	8-9				
447	Superledger	M & R Enterprises	382				
212	The Accountant	Decision Support Software	255				
TAX AIDS							
312	Microtax	Micro Computer Tax Systems	40				
191	Soltax	Design Trends	354				
494	Tax Simple	AJV-Computerized Data Mngt	40				
COMMUNICATIONS TOOLS							
344	Hoscom	N.F. Systems	417				
164	PC Calculator	Cak Corp.	538				
718	Easy Post	Western Union	46				
264	Telbus	Genasys Corp.	496				
COMMUNICATIONS SOFTWARE							
321	Crosslink XVI	MicroSoft Inc.	363				
189	Interloc	Computer Toolbox	352				
471	PC Express	Intelligent Technologies	408, 409				
TERMINAL EMULATORS							
488	Blue Lynx	Techland Systems	278, 298				
466	Emulator	Software Dynamics	633				
530	Emu-tek	FTC Data Systems	727				
365	SmartTerm	Permut	657				
277	Video Display Emulator	Inner Loop Software	364				
397	V-Term	Sunum Consulting	344				
OTHER UTILITIES							
287	Bencware	MCS Software	597				
476	Printer Switch	Intra Computer	132				
125	Reach Out	Arlington Software Systems	395				
FINANCIAL PLANNING SOFTWARE							
585	Bottomline V	Strategic Software Systems	655				
526	Finance 12 Q	Micro Q	133				
241	Financier II	Financier Corp.	13				
534	456 Spreadsheet	Software That Counts	308				
208	Merge/Calc	Cyphel	349				
410	Number Cruncher	Pyramid Data	257				
402	Quik Calc	Simple Soft	294				
185	Your Portfolio SIR	Dow Jones Software	309				
PORTFOLIO MANAGEMENT							
355	Personal Investor	PRII	448				
155	Profit	Business Software	501-503				
440	Stock Portfolio Sys	Smith Micro Software	530				
381	The Investment-Tax Strategist	XQ Software	17				
INFORMATION MANAGERS							
PROJECT MANAGERS							
271	Fast Facts	Innovative Software	191				
403	Micrograph	Earth Data Corporation	686				
451	Project Manager	Soft Corp. Inc.	82				
330	Task Manager	Quala	406				
424	Thoughtware	Thoughtware Inc.	616-617				
CALENDAR/SCHEDULE ORGANIZERS							
824	Brevue	Soft Craft	374				
328	InfoScope	Micro Staff Inc.	174				
*	Project Scheduler	Solart	549				
	T.I.M.	Innovative Software	195				
OTHER INFORMATION MANAGERS							
468	ADAM II	Omni Information Systems	662				
137	Revelation	Comnet, Inc.	449				
528	Summal	Sumward Systems, Inc.	609				
360	Total Recall	Schra Publishing	675				
SOFTWARE FOR PROFESSIONALS							
DENTAL/MEDICAL							
513	Physician Office Computer	Professional Systems Corp.	305				
296	SearchIt	Medisoft	678				
286	Tn-Dent/Tn-Med Mng	Lead Data Inc.	204				
OTHER PROFESSIONS							
*	Real Estate Analyzer	Howard Software	668				
301	Inventory III	Good Software	738				
247	ED, SFTW Administration	Executive Software Programming	323				
596	Professional Software	Univar Systems	679				
292	Prof/Tech Software	Omnisoft	251				
STATISTICAL SOFTWARE							
220	MicroSoft	ECOSoft	308				
502	Statgraf	Village Information	314				
412	Statistical Software	Quant Systems	679				

RS#

PRODUCT

ADVERTISER

PAGE#

RS#

PRODUCT

ADVERTISER

PAGE#

WORD PROCESSING SOFTWARE				HOME MANAGEMENT AIDS			
WORD PROCESSORS				LANGUAGES			
256	Electric Penel	IBC	385	506	Certified Personal Accountant	Sunders Software Corp.	400
268	FriendlyWriter	Friendly Soft.	400-401	116	InShip	DEG Software	476
278	Good Words	Oak Tree Computing	352	101	Check Register	Adventure International	270
187	Letter Library	Delta Point Software	429	490	Menu Notebook	Visual Communications	292
187	Multimate	Softword Systems	34	532	Money Track	Pacific Data Systems	466
188	Palantir	Palantir Software	342	214	Perfin	DEG Software	400
•	PaWriter	Hayden Software	481	561	Smart Checkbook	Softquest	463
144	PowerText	Berman Porter	363				
287	Pro Writer	Broadway Systems	340				
339	Stunstar	Solution Technology	353				
117	Textra	Ann Arbor Software	57				
323	The FinalWord	Mark of the Unicorn	397				
253	The Ultimate	Computer Creations, Inc.	422				
385	Vollmeiter Deluxe	Lifeline Software	333				
374	Wordplus-PC	Professional Software Inc.	26-27				
509	Xywrite	KY Quest	228				
WORD PROCESSING AIDS							
514	Catalyst	Stone & Assoc. Software Publ.	508				
146	Set-PC	Softstyle	61				
	Spell-It	Bermark Systems	127				

MULTIFUNCTION SOFTWARE				COMPILERS			
129	AFX	Coe Executive Application Executive Corp.	104	114	C Compiler	c-systems, Inc.	358
112	Executive Alpha Software	Alpha Software	2	427	C Compiler	Quantum Software Systems	669
230	Executive Series One Plus	Executive Corp.	214, 215	590	C Compiler	Telecom	320
430	Fortheite	Millic Microcomputer Services	717	181	C/C++C Compiler	Computer Innovations	123
360	Ides Processor	Enviroware	213	166	Pascal	Borland International	137
195	MRA	Contract Management Systems	343				
405	Multiram	Softswish	204-205				
404	Open Access	Software Products International	376, 377				
358	Peachtree 9000	Peachtree Software	173-174				
414	TPS	Software Publishing	370-371				
600	Flowtrix	Reston Publishing	409				
				INTERPRETERS			
				493	Fort 32	Quest Research Inc.	619
				273	Interpreters	Watsoft Products	477
				279	PC/PCHT	Laboratory Microsystems	124
				230	Polyforth II Level II	Forth Technology	460
				•	RMACOROL	Cybernetics Inc.	•
				OTHER LANGUAGES			
				343	486-K	Querc	513
				370	Assembler Programs	Interdata Systems	197
				431	Languages	STSC	369
				226	Logo Language	Harvard Associates	468
					Programmers Tool	Network Consulting	487

EDUCATIONAL SOFTWARE				PROGRAMMER'S TOOLS			
578	Black Tack Pro	Software Corp.	280	DATA BASE MANAGERS			
582	Cross Clues	SRA Inc.	263	492	Cratabase	PC Software	35
225	Dr. Logo	Digital Research	334	415	Database Mgr. II	Alpha Software	3
•	Educational Software	Spiralizer Software	14-15	288	DataBase	Software Solutions	358
543	Free Enterprise	SRA Inc.	265	392	Data Design	Insoch	343
156	King James Bible	Bible Research Systems	411	392	DataFilter	MBS Software	397
511	MasterType	Lightning Software	454	108	Data Mate	Compu-Haus	477
•	PC Tutor/PC Pal	Comprehensive Software	12	499	D Base II	Ashlan Tate	495
273	Plato Courseware	Control Data	32, 33, 34, 35	435	Office Windows	Tylog Systems Inc.	456
140	Psyche	Bala Computers Inc.	676	443	Office Windows	Softool Systems	416
139	SpeedRead +	Inert Corp.	324	443	Development Systems	Data Consulting Group	342
				609	EZ Database	DJR Associates, Inc.	566
				181	FMS-80	Ashlan Tate	495
				443	FRICS VDI	MBS/ISE	179
				425	KnowledgeMan	Key Software	175
				294	REQQ	O'Hanlon Computer Services	376
				467	Sensible Solution	Software Technology	311
				136	Veritas Corp.		

ENTERTAINMENT SOFTWARE				PROGRAM DEVELOPER/GENERATOR TOOLS			
279	Art/Tek	Control Concepts	449	134	PC Probe	ATRON	136
518	Breeder	ProTeam	546	419	Program Generator	Sourceware	639
200	Casino Master	Starfire Games	517	248	Quickcode	Fox & Gellert	534
345	Deadline, Suspended, Spoiled	Infocom	429	117	The Last One	Computer Marketing Services	325
731	Droid III	Resolution Software	615	119	Tools, Tools 2	Blaise Computing	394
128	Eilat	Artificial Intelligence Research GP	515				
234	Flight Command	LightHouse Distributing	44				
484	Fun 'N' Games	PC Software	35				
548	Hunt and Seek	Mega Image Software Inc.	10				
147	High Roller Casino	Executive Software Programming	745				
349	J-Bird	Orion Software	79				
165	Millinaire, Baron, Tycoon, Square	Blue Chip Software	143				
367	Persuasion	Oliver Games Inc.	470				
190	Requre	AI Designs	990				
429	S Finks PC	William Funk	380				
578	Software & Games Spec	Sens Electronics Inc.	418				
358	St. Hippolytes Wall	SDI Corp.	488				
209	Tachyon	XOR Corporation	373				
676	Tarot-Vue	Mirror Images	585				
376	Theriac Nuclear War	PC Technologies	724				
470	Zu-Kan Defender	Scifire Games	577				
		Zee Programming	377				
		</					

RS#	PRODUCT	ADVERTISER	PAGE#	RS#	PRODUCT	ADVERTISER	PAGE#
OTHER UTILITIES				MASS STORAGE HARDWARE			
291	BASIC Window	G. Freeman & Co.	476	105	Amdek-V	Amdek	38
299	Compare II	Solution Technology	361	206	Disk Tech One	Disk Tech One Inc.	451
311	Copy II PC	Central Point Software	354	332	Falcon	Teklar Inc.	532
340	C-Window Debugger	c-systems	250	244	File Connection	Flagship Engineering	543
340	Disk Mechanic	MLJ Microsystems	340	249	Hard Disk System	Moscow Hardware	530
361	Edilink Linkup	PCX	360	149	Hard Disk Systems	Cameo Electronics	20
258	8087 Math Package	Hawpauge Computer Works	530	445	Hard File System	Talgrass Technologies	21
305	8087 Support	MicroPro	289	218	Mass Storage	Floppy Disk Services	140
329	File Transfer Pro	Personal Computer Products	739	254	MicroPro	Inferphase Corp.	482
461	MicroPro Software	MicroPro	64-65	124	PC Backup	Alloy Computer Products	299
473	PCPCMS	Technology Systems Organic	254	313	Pegasus XT Conversion		
476	PC Lock	TECH	418	511	RT	Pegasus	429
606	PC Utilities	Karl Associates	516	523	Quadrisk	Quadrant Corp.	482
346	Power Tools	Norton Utilities, The	345	472	QCS HardDrive	Quem Inc.	413
388	Rescue Spacemaker	Rescue, Inc.	477	219	Sygen Image	Sygen Inc.	413
140	SDA	ALSI Computer Enterprises	478	299	Tape Backup	Logic General	28
204	ProStar	Rene Soft	479	219	Tape Backup System	Devoing Systems, Inc.	145
150	View Manager	Blast Computing	994				

HARDWARE

IBM PC COMPATIBLE COMPUTERS		
370	Chameleon	Sequoia
489	Columbia MPC	Columbia Data Pro
*	Compaq Portable Comp	Compaq Computers
269	IBM PC	IBM Corp

.....	150-151
ducts	432-433
Corporation	392-393
	18-19

ACCESSORY CARDS

MULTIFUNCTION BOARD

423	Address Elts
159	Advance Comm.
267	Baby Talk
393	Bus Board
118	Crambo
230	Essiabond, PC Memory
430	Expansion Boards
302	IBM Model 1200
362	Maynard Multiflex; CD
384	Mega Plus
123	Memory, Comm. Ports
134	Multifunction
496	Multi Function Boards
585	Multi Function Boards
1	1 Megabyte Memories
374	PC Multi Pak
325	PD446
152	Permyt Time Spectrum
436	Pro Series
382	Quadboard
452	RAM w/Flash Disk
401	SDI-SSC
401	Switchport
943	System Card
268	System Card

- Prodigy Systems
- AST Research
- Microlog
- LNN Research
- Apparint
- Eastech Corp.
- STB Systems
- Electronic Data
- Maynard Electronics
- Quibe Distributing Inc.
- Aquest
- Automated Business Machines
- Tecmar Inc.
- Tecmar Inc.
- Tail Tree Systems
- Indigo Data Systems
- Perit Data LTD.
- Permyt Products
- Micro Synergy
- Quadram
- Seattle Computer
- Sigma Designs
- California Microcomputer
- Microsoft

VIDEOGRAPHICS BOARD

133 BiGraphics 1+11
444 IBMA
390 Pegasus 3D
337 The Chairman
314 Video/Cassette Board

Applied Computer Products Corp.
TAC
Pegasus
Mylex Corp.
Micro Developed Software

OTHER ACCESSORY CARD

103	All Bds, Peripherals
901	GraphicMaster
147	Graphics Board
261	Hercules Graphic CD
327	Quadlink
*	Super Vision
EXPANSION UNITS	
500	Expandable Memory
591	Titan

Advanced Computer Products...
Tecmar, Inc.
Conographic
Hercules Computer Technology...
Quadram...
California Computer Systems...

PC Technologies
Titan Technologies

MASS STORAGE HARDWARE

206	Amdisk V	Amdisk	38
206	Disk Tech One	Disk Tech One Inc.	651
232	Falcon	Teknar Inc.	532
244	File Connection	Flagstaff Engineering	563
244	Hard Disk Systems	Flagstaff Computing	563
149	Hard Disk Systems	Cameo Electronics	29
445	Hard File System	Tallgrass Technologies	21
216	Mass Storage	Floppy Disk Services	290
216	Mass Storage	Interphase Corp.	285
124	PC Backup	Alloy Computer Products	299
313	Pegasus XT Conversion Kit		
523	QuadDisk	Quadram Corp.	629
523	QuickDisk	Q Systems, Inc.	624
672	Sygen Image	Sygen Inc.	413
297	Tape Backup	Logic General	28
297	Tape Backup System	Devco Systems, Inc.	166

COMMUNICATIONS HARDWARE

MODEM

460	Access 1-2-3
215	Info-Mate Cermetek
448	Modem
453	MT212 PC Modem
316	Oscom, Starcom
171	PC Intellimodem
464	PC Modem Plus
303	Smartmodem
400	Telephone Modem
211	XCop

Novation, Inc.	440-441
Micro Electronics	497
U.S. Robotics Inc.	250
Multi-Tech Systems	361
Incomm	504
Bizcomp	228-229
Ven-Tel	217
Hayes Microcomputer Products	156
Prometheus Products Inc.	722
Castell Computer Center	789

NETWORKING

NETWORKING

- 461 Columbus
- 495 Elan
- 587 Ethernet
- 411 PC Net
- 426 PC Net
- 273 Plato Microlink
- 455 X NET

Novell	396
Tecmar, Inc.	Cover 4
3 Com	330
Orchid Technology	213
Santa Clara Systems	54
Control Data	32, 33, 34, 35
X Conn	48

OTHER COMMUNICATIONS HARDWARE

* Fasttrain
418 Intelligent Add-Ons

Executive Software	313
Tech-S, Inc.	279

DISPLAYS/MONITORS

299	Color Monitor	Princeton Graphic Systems	523
342	Schneider	NEC Information Systems	720-721

PRINTERS

DOT MATRIX		
592	P1350 Printer	Toshiba 302-303
296	Delta 10	Star microics..... 539
257	Ritenor	Informuser 439
DAISY WHEEL		
107	Microscan	Ammico Corp. 790
*	Spent II Plus	Quercus 450-451
594	Tennstar 130	Tennstar 410
PLOTTERS, ETC.		
306	Business Professional	
	Plotter	Hewlett Packard 287
469	Conversa Plotter	Von Leyvitzky Enterprises 45
308	DMP-40 Single Pen Plotter	Houston Instruments 634
329	PC-Plot	Micro Plot Systems 426
311	Plot	Mannesmann Tely 647
TYPEWRITER CONVERTER		
170	Source	Compak Corp. 10

PRINTER AIDS

602 MicroGrip III MicroGrip 456

SOUND RELATED HARDWARE

584 PC Talker Standard Microsystems 636

FURNITURE

283	Chairs	Neodhaus Ergonomic Chairs	366
199	Compact	Compact	231
413	Computer Furniture	Micro-Mate	212
*	Furniture	Lawrence Woodwork	216
300	The Tower	Lifeline Information Systems	522

RS#	PRODUCT	ADVERTISER	PAGE#	RS#	PRODUCT	ADVERTISER	PAGE#
MEDIA							
DISKETTES							
409	Flippy Disk	TDR	506	236	Power Isolates	Electronics Specialists	476
138	Qualimetric Floppydisks	BASF	312	531	Surge Sentry	RKS Industries	314
505	3M Diskettes	3M Data Recording Products Div	291	194	Ultrafuse Computer		365
102	3M Storage Media Pro	Discrete Junction	479	213	VFR 2000 Camera	Design in Fabric	471
283	Wabash Diskettes	Communications and Electronics of Wabash	329	527	Weightmate	Critic Technology	403
				407	Wire Tree	Micro General Corp.	467
						Network	538
ADDITIONAL SUPPLIES				LITERATURE			
PRE-PRINTED FORMS							
167	Blank Forms	Checks To Go	435	425	Bookware	Robert J. Brady	203-205
532	Computer Escort	[M] Inc.	877	174	Computer Books/Software	CBS College Publishing	433
508	The Floppy Disk	Vault Corp.	394	217	Data Source	Data Source Systems	365
KEYBOARD OVERLAYS				153	IBM Encyclopedia	Ashton Tate	210
441	Keyboard Template	Systems Management Assoc.	464	524	InfoSource	Query	364
402	Keyfax	Vertex Systems	386		Software Writer's Handbook	I.P.F.	262
427	Keytop PC	Compu-Med	459	255	Computer Entrepreneur Newsletter	Computer Entrepreneur	367
577	SureStroke	Seasoned Systems	432	157	Data Sources	Data Sources	155-155
307	Touchdowns	Hoodson Co.	397	232	How to locate IBM-PC	Pitkin Learning Systems	388
OTHER SUPPLIES				231	Learning IBM Basic	CompuSoft Publishing	634
366	Accessories	Curtis Manufacturing	223, 225, 227	507	Repair Manual	Personal Systems Publications	224
305	Chocolate Diskettes	Sweetware	877				
246	Computer Case	Computer Case Co.	638	ORGANIZATIONS AND SERVICES			
184	Computer Case	Computer-Mate Inc.	189				
196	Computer Covers	Contemporary Computerware	514	161	CDS Training	CDEX Corp.	178
465	Computer Covers	Covers A Lot	476	111	Executive Information Service	Individual Software	467
172	Disk Cover	CompuCase Corp.	398	529	Instructor	Software Basic Seminars	47
202	Klevert Template	Creative Computer Products	465	145	Instructional Seminar	American Software Club	741
197	The Line	Electronic Protection Devices	169	116	Training Power	American Training Int'l	21
465	MailTrak	TCI Software	514				
299	Monitor Mover	Lantek	476				
275	PC Server	Kensington Microwave	37				
240	Power Director	Computer Accessories	186				

The publisher does not assume any liability for errors or omissions in the product index.

PRICE WAR

GET ALL YOUR PC NEEDS AT DOWN TO EARTH PRICES!!!



IBM PC-2	\$2382
64K 1-320K Drive, FDC & Color/Graphics Card with Green Monitor	
IBM XT	\$CALL
64 KB RAM KIT (in CHIPS) Tested & Burned	\$85
TANDON 100-2	\$249
TEAC BLUE LINE FD-505	\$279
SHUGART 455-2	\$245
QUADRAM MULTIFUNCTION CARD	
SP, PP, C/C, with Mem. & Software	
64K	\$299
256K	\$435
QUAD 512 + 8P with SOFTWARES	
64K	\$239
512K	\$649
MX 512 + 8P with SOFTWARES	
NO RAMS	\$149
64K	\$199
512K	\$579
MX FLOPPY DISK CONTROLLER + PP	
w/Speaker	\$199
NK COLOR GRAPHICS CARD	\$219
MC MULTI I/O BOARD with Software	\$299
C.C. + 1 SP + 1 P.P.	\$159
(Gems Port & 2nd S.P. options)	
MX 7 FUNCTION CARD	
64K to 256K, SP, PP, C/C with Software	\$249
64K	\$249
AST	
Combo Plus 256K Parallel Serial & C/C with Software	\$529
100 Plus Parallel Serial, C/C with Software	\$199
Mega Plus 64K, SP, PP, C/C w/Software	\$299
BIG BLUE TIME SPECTRUM	\$389
Four Function Card	
HERCULES Hi RES. GRAPHICS w/software	\$525
720 x 384 with PP	
FREDERICKS COLOR PLUS 640 x 200 w/software	\$365
MIR MONTI CARLO 5-FUNCTION	\$345
64K - 1M	

HAYES MODEMS	
Smartmodem 300	\$239
Smartmodem 1200	\$29
AMDEK MONITORS	
300A	\$149
310A	\$189
Color I	\$295
Color II	\$445
Color III	\$379
Color IV	\$1079
PRINCETON GRAPHIX	
16 Res. RGB Monitor HX-12	\$515
EPSON PRINTERS	
RX-80	\$349
FX-80	\$575
MX-80 FIT	\$445
FX-100	\$779
OKIDATA PRINTERS	
82A	\$435
83A	\$675
64AP	\$889
84AS	\$1089
92A	\$219
93A	\$879
CITIZEN PRINTERS	
GP-100	\$339
1550	\$682
8510	\$455
STAN MICROPHONICS PRINTERS	
Gemini 10	\$369
Gemini 15	\$535

PC SOFTWARES	
WORDPROCESSING	
WordStar	\$389
Maniferge	\$155
SpellStar	\$195
Word Perfect	\$219
EasyWriter	\$125
Volkwriter	\$125
EasyWriter II	\$155
Select	\$329
SPREADSHEET/GRAPH	
Lobos 1.2	\$349
TK Solver	\$231
SuperCalc II	\$185
Multiplex	\$181
Past Graph	\$171
VisiCalc	\$185
Visi Transfer	\$219
ACCOUNTING	
Home Accountant Plus	\$95
Engle Money Decision	\$125
Tax Manager	\$179
Peachtree GL/AR/AP	\$361
DATA BASE MGT.	
iBase II	\$425
TM II	\$341
Visi Dex	\$185
EasyFilter	\$275
Quick Code	\$215
Visi File	\$231

Every Item Comes with Full Factory Warranty

Prices are subject to change. Quantity discounts available. Purchase orders accepted. Fast service. ADD 3% on Visa & Mastercard. ADD \$3.00 for shipping and handling.

We Repair IBM-PC Systems & Disk Drives, Please Call!

Call for Additional IBM Compatible Hardware/Software Prices!

PC COMPONENTS

17842 Irvine Blvd., Suite 110 • Tustin, California 92680 (714) 669-0774

MICROMAIL™



IBM PC-COMPLETE SYSTEM VERY SPECIAL PRICE

PC System includes 64K IBM PC with two Disk Drives, Controller, Color Graphics Card, Monitor. ...\$2590

SPECIAL OF THE MONTH!!

IBM PC W/64K, 360KB Disk Drive, FDC, Color Graphics Card, Monitor, 10MB Hard Disk W/Controller, Cable, Software, Matrix printer, Cable, all for only ...\$3990

TAVA PC

Desktop Top, IBM PC Bus compatible, runs DOS 1.1, 2.0, CP/M86® ...\$990

EAGLE II

Computer System ...\$1770

DISK DRIVES FOR IBM PC

Tandon 100-2 ...\$240
Slimline DS/DD 320KB ...\$250

MONITORS

AMDEK

300A	\$190.00	I	\$340.00
300G	\$160.00	II	\$690.00
310A	\$190.00	III	\$390.00
IV			\$1190.00

NEC

JB 1201M	\$160.00	JC 1203	\$750.00
JC 1212M	\$330.00	JB 1260	\$130.00

FRINGETON GRAPHICS SYSTEMS

Hi-Res Color ...\$490

PRINTERS

C-ITON

GX-100	\$240	1550	\$690
8510	\$460	F-10	\$1290
F-10			\$1690

DAISYWRITER 2000

CALL

OKIDATA

82A	\$440	84A	\$975
83A	\$690	92A	\$575
93A			\$970

EPSON

FX-80	CALL	FX-100	CALL
-------	------	--------	------

BROTHER

HR-1	\$750
DX-15	\$570

SILVER REED

Printer ...\$690

SMITH CORONA

TP-1 ...\$520

STAR MICRONICS

Gemini 10 ...CALL

Gemini 15 ...CALL

NEC SPINWRITER

771G-1	\$2050	3510	\$1450
771S-1	\$2200	3515	\$1450
7720-1	\$2500	3530	\$1650
7725-1	\$2500	3550	\$1950
7730-1	\$2050	PC8023A	\$550

HARD DISKS FOR APPLE AND IBM

CALL

MEMORY BOARDS

MONTE CARLO ...CALL

TECMAR ...CALL

AST

IO Plus. Five function Card ...\$199

Combo Plus. 4 function card. Fully pop. 256K ...\$490

Mega Plus. Fully pop. 512K ...\$990

AST SIXPAK 384K ...CALL

QUADRAM

Quad Card. Fully pop. 256K ...\$500

QUADLINK ...CALL

BIG BLUE ...\$470

HERCULES Graphics Card ...\$490

MAYNARD SANDSTAR SERIES

FDC 5 1/4 & 8" ...\$220

Multifunction Card ...\$90

Memory Card ...\$180

MICROMAIL

631 E. First St., Tustin, CA 92680

PRICES AND AVAILABILITY SUBJECT TO CHANGE WITHOUT NOTICE

(714) 838-9100

APPLE is a trademark of Apple Computers, Inc.
IBM is a trademark of IBM Corp.
CP/M86 is a trademark of Digital Research, Inc.

Small manufacturers have found that riding the tail of the comet can be an exhilarating business feat, but staying on requires marketing prowess.

Second-Hand Success

An incredible number of success stories surround the IBM PC. Microsoft is probably at the top of the list, but then, it was a class act before the PC: the association with IBM simply has given the company's bottom line a hefty kick. Still, give Microsoft credit for acting quickly and so well.

Most of the other stories, though, involve smaller firms, many of which did not exist on August 12, 1981. You can leaf through the pages of this magazine and find many of them. Compare their ads in this issue with their ads a year or 18 months ago. In many cases there will be a striking difference.

It should come as no surprise that a lot of folks saw the announcement of the PC as a new wave that they wanted to ride. For quite a few, their rapid perception has paid off handsomely. Think about a company that starts from zero and 2 years later has revenues of \$30. million. AST Re-

search and Davong Systems fit into that category. And they have reputations to match their revenues, too.

For others, it was simply a matter of converting a software product designed for some other computer to the PC. For many of these companies, sales of the PC

that most PC products sell at about one-tenth the price of their minicomputer counterparts, it's not hard to see that these companies are riding high.

Our advertising in PC Magazine may be the absolute measure of the size and success of the PC aftermarket. These third-party suppliers (IBM is the first party; you, the PC buyer, are the second) are quick, smart, competitive, aggressive, and tough, and there are a lot of them.

Hand-Me-Downs

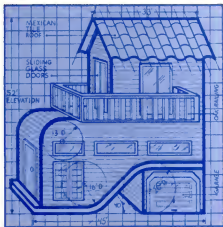
As successful as the aftermarket is, however, it must remember that it owes something to IBM. It is a second-hand success. If that doesn't send shivers up and down your spine, it should, because IBM is, and always has been, a force to be reckoned with.

History serves to underscore the point. IBM is behaving now just as it has throughout its spectacular existence. It

T **THINK ABOUT**
*a company that starts
from zero and 2 years
later has revenues of \$30
million.*

version outsell the original by factors of two, three, or more to one, and not in units, but in dollars! When you consider

WE COULD SHOW THE OLD WOMAN WHAT TO DO WITH THE SHOE.



INVESTOR III™ makes rhyme and reason out of real estate investing.

Now you can maximize your real estate profits and avoid questionable ventures with the help of Investor III™.

Investor III™ was conceived and developed by a real estate company. So it's practical and comprehensive. Ready to meet the needs of the average investor or professional user with capabilities like pro-forma, "what-if" analysis, cash flow before and after taxes, depreciation and more.

Yet Investor III™ is as simple as Mother Goose — you can learn to use it in less than one hour.

So whether you're looking at a multi-million-dollar high rise or a cozy rent house with some unique qualities, Investor III™ can help you determine the wisdom — and profitability — of your choice.

Write or call for more details today. Investor III™...for investments that fit. And that's no fairy tale.

Good Software is proud to announce an easy-to-use amortization package — the Amortizer III™.



A Division of The Goodman Group, Inc.
12900 Preston Rd., Dallas, Texas 75230 (214) 239-6085
Compatible with Radio Shack TRS-80 and IBM PC.
Investor III™: \$249.00 plus \$5 shipping and handling.
Amortizer III™: \$49.95 plus \$5 shipping and handling.
American Express, MasterCard and Visa accepted.
Dealer inquiries invited.

**Making dollars and sense
out of information.**

CIRCLE 301 ON READER SERVICE CARD

markets hard and well. Now that the shackles of the antitrust suit have been removed, and now that AT&T has been "deregulated," IBM has become even more competitive. As this meant trouble for the mainframe vendors of old, so it

THE aftermarket must remember that it owes something to IBM.

does for the aftermarket today. Interestingly enough, tales of these happenings have been played out over such a short period of time that we easily can look back and remember what happened.

Consider the original 64K PC. Remember what the first add-in product was? Right. Memory boards came bounding out of the blue from companies no one had heard of. Then somebody counted the slots in the system and thought, "Heck, there ain't that many!" and the multifunction card business took off.

IBM, with their miserly 32K and 64K add-in boards, reacted. Not right away, mind you, but soon enough. By early this year, IBM PCs and XT's all had 256K on the motherboard, more than enough for almost any application. At that instant, a bunch (as in more than a few but not all) of these memory-board manufacturers gave up the ghost. Perhaps they had just gotten started and could not afford to invest in R&D for another product. Perhaps they didn't have the foresight of some other firms. Whatever the reason, an IBM marketing decision had cut them out.

The multifunction board manufacturers got hurt too. With 64K now standard and up to 256K available from the original vendor, the user couldn't necessarily see the need for additional memory. Prices came crashing down, and a new wave of products was introduced, mostly of the everything-you'd-want-on-a-multifunction-card-except-the-memory variety.

A few companies were watching this carefully and took slightly different action. LNW and Maynard, for example, have introduced products that have no personality at all. You must order their

basic boards and specify the exact options you desire. These are then plugged onto the baseboard and, voila, a customized multifunction board. Both these boards are a little more expensive than average, though, and one is led to believe they were

A SMALL company has to have a significant price advantage over the IBM alternative.

designed to protect their companies' ability to offer products that matched whatever the current need, whatever the current IBM configuration.

AST and STB took a different tack. They both built boards with room for 384K of memory and one of just about everything else you can think of, including a game adapter. The trick is the board's capacity for RAM, which, when added to the base 256K PC, brings the amount of memory up to 640K, the PC's stated maximum. Although both companies had products that could be expanded to as much as 512K, they had trouble explaining how a 768K machine might work, given an IBM/DOS limit of 640K. Further, the price of these boards (\$395 with 64K installed) is very, very low.

The Moral of the Story

What do we learn from all of this?

Lesson 1: IBM can make a very simple change to its product (such as an upgrade to 256K) that will send a tidal wave through the aftermarket. The folks competing out there, especially those in the smaller firms, have to be on constant alert to be sure they are prepared for the almost inevitable changes. Attention to cash flow and R&D expenditures is critical, because a new product may have to be devised virtually overnight to protect a firm's market share.

Lesson 2: An aftermarket company has to have a strong marketing capability. When IBM announces something that endangers a firm's product line, the smaller firm has to be ready to explain why its product is still a better or more effective choice. The

same marketing team has to be responsive to shifts in the aftermarket to be sure the development teams are working on the right new products and that they will be able to be successfully marketed once announced.

Lesson 3: A small company has to have a significant price advantage over the IBM alternative. In the past, IBM's competitors had to offer at least a 20 percent reduction in price and deliver more function to boot! The same seems to be holding true with regard to the PC. A little marketing savvy has to be used as well. There has to be room for the price to move downwards when pressed by an IBM announcement, without causing all the margin to evaporate. In our multifunction card example, consider that every manufacturer also delivers electronic-disk and print-spooler software.

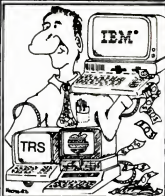
Lesson 4: Whatever product is offered, the company must be able to explain it. Memory and multifunction cards didn't take much explanation; most people can count. The more complicated ones must be explained very carefully, and in terms the buyers (and the sellers, in fact) can understand. Remember one thing: only IBM can get away with limited explanations.

Lesson 5: A product must be innovative within its lifespan. A company introducing a multifunction card now (with the exception of IBM) better have a really good story. Furthermore, the company must have the resources to deliver the new product within its useful lifespan or the development effort will have been wasted.

ONLY IBM can get away with limited explanations.

Sometimes, this can be a real strain on capital and, of course, on staff.

Although second-hand success might sound as if it implies no more than jumping on the coattails of that giant party of the first part, it's almost a certainty that a third-rate company won't make it for long. The short history of the IBM PC tells us that it takes the right stuff for PC-aftermarket companies to succeed. /PC



FILE TRANSFER PROGRAMS

TRS → IBM PC or XT

APPLE → IBM PC or XT

Transfer your TRS Model I, II, III, 4, 12 or 16 files to the IBM PC or XT.

Transfer your Apple II, II+, or IIE files to the IBM PC or XT.

- No more retyping or wasted time
- Fast transfer-baud rates of 110-9600
- File concatenation supported
- Send files of any length
- Make \$\$\$ - the IBM PC is new and software is scarce-take your "new" programs and sell them for \$\$\$
- Transfer ASCII files, random files, text files, data files, binary files, high level language programs (Basic, Pascal, Fortran, Cobol, etc.), electronic spread sheet data, word processor files, etc.: it all gets transferred!

The File Transfer Program comes complete with all instructions, hardware and software (for both machines)

FILE TRANSFER PROGRAM diskette
(Works with IBM DOS 1.1 or 2.0)

APPLE — \$99.95

TRS — \$89.95

(State TRS model when ordering)

Plus \$2.00 shipping & handling
(CA residents add 6.5% State sales tax)



MCNISA/COO/CHK

Phone orders call

(408) 988-0164

PERSONAL
COMPUTER
PRODUCTS

1400 Coleman Avenue, Suite C-18,
Santa Clara, California 95050

IBM is a registered trademark of International Business Machines Corp.
Apple II, II+, and IIE are registered trademarks of Apple Computer Inc.

CIRCLE 369 ON READER SERVICE CARD

SATISFACTION GUARANTEED! OR YOUR MONEY BACK!

JADE Computer Products

FAST SERVICE
FULL SUPPORT
LOW, LOW PRICES SINCE 1975

SIX PAK PLUS—AST

Up to 384K RAM, clock/calendar with battery back up, serial port, parallel printer port, game port, superdrive and super spool software included FREE!

MEX-38064A 84K, C.S.P.	\$299.95
MEX-38256A 256K, C.S.P.	\$449.95
For Game Port Option Add	\$39.95

MEGA PLUS—AST

Up to 512K RAM, clock/calendar with battery back up, 2 serial ports, parallel printer port, game port, super drive and superpool software included FREE!

MEX-51064A 84K, G, 1 serial	\$299.95
MEX-51000S Second serial port option	\$39.95
MEX-51000P Printer port option	\$39.95
MEX-51000G Game port option	\$39.95
For Each Additional 84K RAM Add	\$49.95

COMBO PLUS II—AST

Up to 256K of RAM, clock with battery back up, serial port, parallel printer port, superpool software included FREE!

MEX-25064A 84K, C.S.P.	\$299.95
MEX-25256A 256K, C.S.P.	\$419.95

I/O PLUS II—AST

Up to 2 serial ports, parallel printer port, game port, clock/calendar with battery back up, super drive and superpool software included FREE!

IOI-7508A Clock & 1 serial port	\$139.95
IOI-7509P Printer port option	\$39.95
IOI-7500S Second serial port option	\$39.95
IOI-7500G Game port option	\$39.95

QUADBOARD I—QUADRAM

Up to 256K RAM, serial port, parallel printer port, clock/calendar, RAM disk, and printer spooler software

MEX-41064A 84K Quadboard	\$279.95
MEX-41256A 256K Quadboard	\$399.95

QUADLINK—QUADRAM

Allows IBM PC to run Apple software. Includes interface card and software to allow your IBM PC to run both Apple DOS and CP DOS

CPX-5000A Quadlink	\$499.95
--------------------	----------

SYSTEM CARD—MICROSOFT

From the authors of MS-DOS—up to 256K RAM, serial port, parallel printer port, clock/calendar, plus RAM drive disk emulation, print spooler, time utilities, and terminal emulation software. DOS 1.1 or 2.0 compatible

MEX-18064A 84K system card	\$279.95
MEX-18256A 256K system card	\$429.95

MONTE CARLO CARD—MBI

Up to 512K RAM, clock/calendar, parallel printer port, serial port, GT model has dual port joystick adapter

MEX-58064G 84K Monte Carlo Quattro	\$299.95
MEX-58064A 84K Monte Carlo GT	\$349.95

HI-RES COLOR MONITORS

Only the best Quadchroma or Princeton HX-12, 690 x 480 resolution, 16 brilliant colors, special 31mm dot-pitch tube, includes FREE! cable

VDC-241301 Quadram Quadchrome	\$489.95
VDC-241401 Princeton Graphics HX-12	\$499.95

NEC or AMDEK, popular RGB monitors for your IBM PC

VDC-462000 NEC JC 1203 RGB	\$599.95
VDC-461320 Amdek Color II	\$439.95

HERCULES GRAPHIC CARD

Two pages of ultra-high resolution text and graphics 720 x 348, compatible with Lotus 123, Visicalc, dBase II, etc. Includes parallel printer port

IOV-8016A Hercules graphic card	\$369.95
---------------------------------	----------

PLANTRONICS COLOR PLUS

Up to 18 colors, 80 characters, biplanar technology, includes parallel printer port

IOV-8018A Plantronics Color Plus	\$379.95
----------------------------------	----------

QUADCOLOR I & QUADCOLOR II

Quadcolor I delivers standard IBM PC color and graphics, add Quadcolor II and hi-resolution (840 x 200) color graphics are possible

IOV-4018A Quadcolor I basic board	\$234.95
IOV-4028A Quadcolor II add on	\$229.95

64K RAM UPGRADE For IBM PC

High speed RAM upgrade kit with parity (error detection) and one year warranty

MEX-4100K 64K kit for IBM PC	\$49.95
------------------------------	---------

THE BEST SOFTWARE For IBM PC

We have taken the top rated programs and reduced the price making them a super value

LOTUS 1 2 3 Best spreadsheet	
8FP-3400100M Lotus 123 (1A)	\$329.95
dBASE II Best Data base	
8FP-1123100M Ashton-Tate dBASE II	\$429.95
WORDSTAR Best word processor	
8FP-13600100M MicroPro Wordstar	\$299.95
PROPACK Wordstar/Mail/Spelt/Starindex	
8FP-13600900M MicroPro's Best	\$394.95
VISIBILITY Best Data Base, Index	
8FP-1410100M VisiCorp VisiCalc	\$199.95
CROSSTALK Best communications package	
8FP-3377100 MicroStuff Crosstalk	\$129.95
MULTIPLAN Best selling spreadsheet	
8FP-1630100M MicroSoft Multiplan	\$179.95
FLIGHT SIMULATOR Best flight simulation	
8FP-3320100 Microsoft Flight Simulator	\$39.95

JADE IS AN AUTHORIZED DEALER FOR OKIDATA & EPSON PRODUCTS

NOW BETTER THAN EPSON

Okidata's new plug-n-play ROMS for Ok 92 or Ok 93 printers are fully IBM PC compatible! 412 ASCII characters, full graphics, complete Epson emulation, and near letter quality printing not available with Epson

PRM-43092 Okidata 92 180 cps	\$499.95
PRM-43093 Okidata 93 180 cps	\$799.95
PRA-43094 Plug-n-play for 92	\$45.95
PRA-43097 Plug-n-play for 93	\$45.95
WCA-2536A IBM PC to Ok or Epson cable	\$32.95

NEC 3550 LETTER QUALITY

Only full IBM PC compatible letter quality printer available—why settle for less!

PRD-35501 NEC 3550 printer	\$1799.95
----------------------------	-----------

HAYES SMARTMODEMS

300 and/or 1200 baud direct connect, auto answer-auto dial, pulse or touch tone, auto baud rate selection, 1200B is a plug-in board for IBM PC only and includes Smartcom II FREE

IOH-5550A 1200B with Smartcom II	\$399.95
IOH-5550A Smartmodem 1200	\$499.95
IOH-5550A Smartmodem 300	\$199.95
8FP-5550050M Smartcom II	\$79.95

320K DISK DRIVES

Tandon TM-100-2 double-sided, double-density 320K disk drive. Original equipment drive on IBM PC

88M-551002 Full size Tandon	\$234.95
88M-551004 Half-height 320K drive	\$199.95

DISKETTES For IBM PC

High quality 320K double-sided, double-density diskettes, certified to be absolutely error free. Box of ten, warranted for one year

MMD-8320104 With FREE! plastic box	\$34.95
MMD-8320101 Verbatim Datafile	\$34.95

THE BEST MOUSE

From Mouse Systems. Optical mouse with no moving parts—nothing to wear out, includes software and is compatible with all major software packages—a guaranteed best buy!

8YX-14100A Mouse Systems mouse	\$249.95
--------------------------------	----------

MICROSOFT MOUSE

Mechanical mouse from the folks that wrote your pc's operating system. Includes software and cables

8YX-16100A Microsoft mouse	\$149.95
----------------------------	----------

PLACE ORDERS TOLL FREE

4901 West Rosecrans Ave. Hawthorne, California 90250

Continental U.S.

800-421-5500

Inside California

800-262-1710

We accept cash, checks, credit cards, or Purchase Orders from qualified firms and institutions.
Minimum prepaid order \$15.00 California residents add 6 1/2% tax. Export customers outside the U.S. or Canada please add 10% to all prices. Prices and availability subject to change without notice.
Shipping and handling charges via UPS Ground \$06.1b UPS Air \$1.00/lb. minimum charge \$3.00

CIRCLE 357 ON READER SERVICE CARD

For Technical Inquires
or Customer Service call:
213-973-7707

Coming Up in PC Tech Journal

C and PC

Part I of a two-part, 10-compiler review. In this issue, the first five: Lattice C, Microsoft C, C86 from Computer Innovations, and more.

Inside Microsoft BASIC

How one BASIC-to-8086 translator works, plus predictions about the next release of Microsoft BASIC.

Etherseries

An in-depth look at 3Com's Ethernet-based LAN. Our writer lays out the parts of the network and explains how each functions.

Interrupts and the IBM PC

The first part of this two part article describes the PC's interrupt system, filling in a gap in IBM's documentation. The 8295A is revealed.

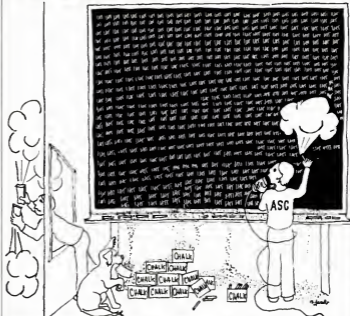
Graphic Reviews

The pros and cons of four color boards, including Universal Research MultiDisplay Adaptor, Amdek Multiple Adapter Interface, and Tecmar PC-Mate, plus reviews of two monochrome boards.

Stretch PC

Reviews of expansion chassis from Tecmar and IBM, comparing configurations for performance and price.

15K MEMBERS AND GROWING



American Software Club has been selling software for the APPLE, ATARI, IBM, TRS-80 and C/P/M Computers (DEC, Eagle, Vector 4, Northstar, Xerox 820, Superbrain, Heath/Zenith, NEC, Televideo, Altos, Columbia, Osborne, Sanyo) since 1981. Computerists don't just join ASC—they stay with us.

Chalk it up to...

Having 600 products in stock and our "lowest price" guarantee.

Chalk it up to...

Our free bi-monthly Compendium magazine which gives comprehensive product descriptions, club news, and services.

Chalk it up to...

Our toll free technical support and order lines. ASC doesn't just sell software—we support it!

Chalk it up to...

Speedy shipping. Because we know waiting can be frustrating, ASC has been shipping more than 60% of orders in under 6 hours.

But don't just take our word for it. Join now, and take advantage of our free one year membership offer. With absolutely no purchase obligation, you have nothing to lose and everything to gain.

Wondering if there are strings attached? The only one is in the cartoon...

For a One-Year Trial Membership with no fee or obligation, fill out the coupon or call our Toll Free Number:

1-800-431-2061

(CT Residents call 203-431-4966)

American Software Club, Inc.

80 Topstone Road, Ridgefield, CT 06877

Please begin my free one-year trial membership as outlined above.

Name

Address

City/State/Zip

Outside the US: Please enclose \$75.00 (US) for a one year membership

My computer is:

- ☐ APPLE
☐ ATARI
☐ IBM PC
☐ TRS-80
(Mods 1, 2, 3, 4)
☐ C/P/M (8" or 5 1/4")



CIRCLE 145 ON READER SERVICE CARD

PC MAGAZINE 761 NOVEMBER 1983

Index To Advertisers

READER SERVICE NO.	ADVERTISERS	PAGE	READER SERVICE NO.	ADVERTISERS	PAGE	READER SERVICE NO.	ADVERTISERS	PAGE
134	ABM	90	174	CBS College Publishing	423	204	Corona Data Systems	184-185
135	Access Unlimited	364	181	CDEX Corporation	178	137	Cosmos	446
103	Advanced Computer Products	300	213	Celtic Technology	471	*	Covers-A-Lot	876
101	Adventure International	295	486	Centennial Products	453	202	Creative Computer Products	465
494	AJV-Computerized Data Management	40	131	Central Point	256	205	Creativity Unlimited	515
124	Alloy Computer Products	289	215	Cermetek Micro Electronics	487	371	C Source	529
112	Alpha Software	2	177	Checks-To-Go	431	160	c-systems	358
139	Alpha Software	3	480	CMC International	432-433	372	CTC Electronics	346
105	Amdek Corporation	36	283	Columbia Data Products	329	164	CTEK Corp.	528
145	American Software Club	741	*	Communications Electronics for Wabash	392-393	*	Curtis Manufacturing	223, 225, 227
116	American Training International	11	767	Compaq	436-437	143	Cybernetics	200
106	AmeriSoft	557	170	Complex Systems Support	25	168	Cygnnet Technology Inc.	113
159	AMI-Automation Management Inc.	644	172	ComputAdd Corp.	372	285	Cygnnet Technology Inc.	317
107	Ammicro Corp.	290	199	ComputCable Corp.	396	208	Cypher	349
117	Ann Arbor Software	57	106	Computacur	231	176	DataBase Industries	352
109	Apogee	456	110	Compu-haus	477	175	Data Base Solutions	264
118	Apparel	68	227	CompuMail	483	*	Data Consulting Group	242
129	Application Executive Corp.	106	450	Compu-Med.	459	515	Data Sources	551
120	Applied Computer Products Corp.	134-135	481	Compu Media	476	157	Data Sources	152-155
133	Applied Computer Products Corp.	480	111	Compu Service Information	217	219	Data Source Systems	566
136	Applied Software Technology	511	231	CompuSoft Publishing	487	219	Devong Systems, Inc.	185
123	Apstek, Inc.	63	173	Computech Group Inc.	834	221	Decision Resource	10
125	Arlington Software Systems	395	240	Computech Group Inc.	486	265	Decision Resource	580-581
198	Artificial Intelligence Design	590	114	Computer Accessories	180	212	Decision Support Software	255
128	Artificial Intelligence Research Group	501	115	Computer Advanced Ideas	496	186	DEC Software	496
151	Ashlon-Tate	210	246	Computer Apparatus	322	214	DEC Software	496
153	Ashlon-Tate	210	192	Computer Case Co.	638	187	Delta Point Software	429
499	Ashlon-Tate	495	253	Computer Control	41	194	Designs in Fabric	365
154	AST Research	82-85	255	Computer Creations	422	191	Design Trends	354
121	AST Research	87	255	Computer Entrepreneur	387	201	DGM Corp.	676
457	ATECH-Tokyo Electronics	336	160	Computer Exchange	42-43	222	Diamond Software	266
134	Atron	126	122	Computer Hut	427	193	Diamond Software	267
104	AUE Computer Enterprises	676	107	of New England	427	209	Digital Control Systems	105
140	Balls Computers	676	181	Computer Innovations, Inc.	222	446	Digital Dimensions	681
138	BASF Systems	312	127	Computer Island	598	225	Digital Research	334
142	BCC, Inc.	459	162	Computerline	380	230	Discount Software	626
144	Beaman Porter	583	262	Computerline	418	206	DiscTech One	951
146	Berzark Systems	127	183	Computer Mail Order	276-277	179	Diskette Connection	358
156	Bible Research Systems	811	119	Computer Marketing Services, Inc.	325	102	Diskette Junction	576
171	Bizcomp	228-229	184	Computer Mate	189	609	DJR Associates Inc.	569
150	Blaise Computing Inc.	594	256	Computer Outfitters	314	165	Don-El Computer Products	677
185	Blue Chip Software	143	182	Computer Outlet	110-111	234	Don Jones Software	300
166	Borland International	137	485	Computer Post	279	603	800 Software	76
152	The Bottom Line	128-129	190	Computer Store, The	878	230	Earth Data Corp.	686
163	Bristol Information Systems	244	169	Computer Toolbox	552	235	Eastech Corporation	22-23
155	Business Software	501, 502, 503	130	Computers and More	365	220	Eastern Enterprises	527
148	California Computer Systems	161	126	Compuview Products	357	197	Ecosoft	358
*	California Microcomputer	514	147	Coographic	326-327	207	Electronic Protection Devices	171
149	Cameo Electronics	20	132	Consolink Corp.	4	236	Electronic Protection Devices	171
211	Capitol Computer Center	297	196	Contemporary Computerwear	514	237	Electronic Specialists	476
			195	Context Management Assoc.	243	228	Emerging Technologies Consultants	122
			273	Control Data Corp.	32-35	245	Enertronics Research	180
			279	Control Concepts	489	210	Eros Computer	40
			200	Coosol	527	210	Executive	214-215
						*	Executive Software	313
						247	Executive Software	

READER SERVICE NO.	ADVERTISERS	PAGE	READER SERVICE NO.	ADVERTISERS	PAGE	READER SERVICE NO.	ADVERTISERS	PAGE
	Programming.....	323	433	Jack Strick & Associates.....	359	436	Micro Storehouse.....	470
478	Executive Software		357	Jade Computer Products.....	740	326	Microstuf Inc.....	174
	Programming.....	745	606	Katt Assoc.....	518	321	Microstuf Inc.....	363
243	1st National Computer.....	268	275	Kensington Microware.....	37	438	Micro Synergy Inc.....	475
242	47th St. Computer.....	692	294	Key Software.....	175	328	MicroTaire.....	326
241	Pinocler Inc.....	13	276	Laboratory Microsystems.....	124	331	Microware.....	576
244	Flagstaff Engineering.....	883	251	Lake Avenue Software.....	211	335	Microware.....	570
232	Filtrack Learning Systems.....	338		* Lawrence Woodwork.....	218	341	Micro Xpress.....	444
218	Floppy Disk Services.....	160	377	Leading Edge.....	Cover 2	332	Miller Microcomputer	
532	FMJ.....	677	280	Leading Edge.....	Cover 2		Services.....	717
238	Forth Technology.....	60	281	Leading Edge.....	Cover 2	364	Mirror Image Software Inc.....	521
248	Fox & Geller.....	524	286	Lear Data Ltd.....	204	359	Mirror Image Software Inc.....	505
249	Frederick Computer.....	361	300	Lifeline Information		340	MLI Microsystems.....	359
	* Frederick E. Deeg and Assoc.....	564		Services.....	522	599	Morgan Computing Corp.....	870
268	Friendly Soft.....	480-481	365	Lifetree Software.....	232	289	Mountain Computer.....	230
250	FTG Data Systems.....	727	254	Lighthouse Distributing.....	44	388	MPPI.....	416
264	Genasys Corp.....	406	296	Lighthouse Software.....	716	447	M&R Enterprises.....	382
223	General Technology.....	130	511	Lightning Software.....	456	453	Multi Tech Systems.....	361
291	G. Freeman & Co.....	478	252	Link Systems.....	269	337	Mylex Corp.....	548
295	Golden Software.....	557	289	Liotek.....	478	342	NEC Information	
301	Good Software.....	738	383	LNW Computers.....	310-311		Systems, Inc.....	720-721
260	H&E Computronics.....	746	297	Logic General.....	28		* Network Consulting, Inc.....	407
304	The Happy Computer.....	653	282	Logisoft.....	268-289	454	Network.....	536
228	Harvard Assoc.....	678	263	Macola Inc.....	678	344	N.F. Systems Ltd.....	617
258	Hauptpage Computer		388	Magnum PC.....	616	353	Nordhaus Ergonomic Chairs.....	366
	Works, Inc.....	530	311	Mannesman Talley.....	447		* North American Business	
	* Hayden Book Company.....	513	323	Mark of the Unicorn.....	397		Systems.....	Cover 3
	* Hayden Software.....	193, 481	391	Mark Williams.....	500	456	North Lake PC.....	459
303	Hayes Microcomputer.....	156	302	Maynard Electronics.....	158-159	346	Norton Utilities.....	245
281	Hercules Computer			* MBSI.....	5	460	Novation.....	440-441
	Technology.....	71	382	MBS Software.....	597	481	Novell.....	396
229	Heritage.....	80-81	396	McClintock Corp.....	515	278	Oak Tree Computing.....	552
306	Hewlett Packard Corp.....	206-207	290	MCP Applications.....	350	367	O'Hanlon Computer Services.....	376
307	Hooloo.....	597	287	MCS Software.....	285	367	Olorin Games.....	479
308	Houston Instrument Division of		525	MDBS Knowledge Mao.....	176	462	Omega Information Systems.....	682
	Bausch & Lomb.....	434	288	MediSoft.....	678	373	Omega Microware, Inc.....	442
113	HRCOM International.....	560	406	Megabyte Industries.....	477	348	Omicron.....	593
	* Howard Software.....	448	366	Micro Computer		305	Omicron.....	595
289	IBM.....	18-19		Accessories.....	534-537	292	Omnisoft Corp.....	251
310	IdeaWare.....	283	312	Micro-Computer		411	Orchid Technology.....	213
	* IDE Corp.....	178-177		Taxsystems Inc.....	48	349	Orion Software.....	79
256	IIG.....	385	324	Microdel.....	348	351	Oryx Software.....	454-555
318	Incomm Co.....	584	315	Micro Flash.....	507	378	Pacific Blue Micro.....	620
274	Indigo Data Systems, Inc.....	24	527	Micro General.....	403	522	Pacific Data Systems.....	464
529	Individual Software Inc.....	16	158	Micrograph.....	543	186	Palantir Software.....	342
318	Inet Corp.....	324	602	Micro Grip Ltd.....	456	355	PBL Corp.....	468
345	Infocom.....	439	317	Microhouse.....	320	475	PC Annex.....	118-121
257	Inforunner.....	439	287	Microlog.....	233	333	PC Compocools.....	735
277	Ionor Loop Software.....	364	518	Microlog.....	187	358	PC Connection.....	532-533
272	Innovative Software.....	555	347	Micro Mail.....	736	339	PC Connection.....	531
271	Innovative Software.....	191	528	Micro Management.....	248	479	PC Designs.....	359
288	Insoft.....	343	319	Microcart.....	420-421	403	PC Link Corp.....	274
471	Intelligent Tech			* Microcart.....	419	483	PC software.....	51
	International.....	406-409	320	Micro Match.....	136	484	PC software.....	53
350	Interdata Systems.....	167	413	Micromate.....	212	482	PC software.....	55
178	Interface.....	610	329	Microplot Systems.....	62	392	PC Software Interest Group.....	547
284	International Disk.....	577	421	Micro Pro.....	64-65	498	PC Technologies.....	724
354	Interphase Corp.....	282	806	Micro-Q.....	133	500	PC Technologies.....	725
478	Intra Computer.....	132	428	Micro Rim.....	148-149	503	PC Technology.....	679
	* IPF Publications.....	262		* Micro Rim, Inc.....	1	383	PC Ware Incorporated.....	734

READER SERVICE NO.	ADVERTISERS	PAGE	READER SERVICE NO.	ADVERTISERS	PAGE	READER SERVICE NO.	ADVERTISERS	PAGE
381	PCX	390	443	R.T.C.S. Corp.	648	395	Sweetware, Inc.	677
358	Peachtree Software	172-173	*	Safeware	445	757	Symmetric Software	50
390	Pegasus	478	428	Santa Clara Systems	54	472	Sysgen Industries	413
313	Pegasus	629	719	Satellite Software		441	Systems Management	
385	Persoft Inc.	457		International Inc.	70		Assoc.	488
389	Personal Computer Products	739	397	Saturn Consulting	344	587	3 Comm	330
314	Personal Computer Software		715	Science Management Corp.	415	505	3M Data Recording	
	Specialists	684	*	Scitor Corp.	548		Products	291
507	Personal Systems		*	Scottdale Systems Ltd.	345	444	Tac.	30-31
	Publications	224	449	SDL Corporation	388	445	Tallgrass Technologies	21
233	Personal Tutor	854	429	Seas Electronics Inc.	418	487	Tall Tree Systems	113
512	Persysat	318-319	577	Seasoned Systems	632	362	Tava/Compushack	561
309	Prentice-Hall	378-379	452	Seattle Computer	275	485	TCI Software	514
299	Princeton Graphics Systems	523	370	Seequn	150-151	409	TDK	506
374	Professional Software Inc.	26-27	437	Sierra Data Sciences	542	588	Team Computers	516
513	Professional Systems		401	Sigma Designs	241	463	Techland Systems	288
	Corp.	205	402	Simple Soft	294	488	Techland Systems	278
423	ProfitSystems, Inc.	91	578	Skillware Corp.	280	417	Technology/Systems Organization	
375	Programming		579	Small Business			Inc.	254
	International	246-247		Systems Group	512	418	Tech-S Inc.	271
338	Programming International	375	440	Smith Micro Software	550	495	Tecmar Inc.	Cover 4
322	Programming International	270	360	Soft Publishing	875	498	Tecmar Inc.	183
517	Programs Plus	365	451	Soft Corp. Inc.	52	497	Tecmar Inc.	180
400	Prometheus Products Inc.	722	404	Soft Craft	374	501	Tecmar Inc.	181
518	Protium	546	580	Softlink	384	589	Tecmar	182
325	Pure Data Ltd.	462-463	581	SoftQuest	883	332	Tekner	532
510	Pyramid Data	257	405	Softsmith	284-285	590	Teleson	477
519	Pyramid Data	259	514	Softstyle	81	424	Thoughtware, Inc.	416-417
520	Pyramid Data	261	462	SoftTool Systems	818	381	Titan Technologies	578
381	Pyxel	249	732	Software Banc. Inc.	46	592	Toshiba	302-303
381	Quadram Corp.	17	758	Software Banc. Seminars	47	583	Transaction Storage	
362	Quadram Corp.	824	466	Software Dynamics	633		Systems	630
327	Quadram Corp.	87	418	Software 'N' Stuff	647	605	Transend	280
521	Quadram Corp.	462	804	Software Products		594	Transtar	410
330	Quia	486		International	272-273	491	Trillian Computer	574
412	Quant Systems	678	414	Software Publishing	370-371	435	Tylog Systems	606
427	Quantum Software	468	415	Software Solutions	558	800	United Computer Corp.	72
394	Qubie Distributing, Inc.	188	534	Software That Counts	306	595	United Software of	
379	Qubie Distributing	188	394	Software Writers			America	337
334	Qubie Distributing Inc.	504		International Guild	296	596	Univair Inc.	679
523	QuCeS, Inc.	650	477	Softword Systems	38	448	U.S. Robotics, Inc.	258
343	Quelo	515	442	Solution Technology	351	508	Vault Corp.	394
524	Query	364	389	Solution Technology	353	464	Ventel	217
493	Quest Research, Inc.	818	*	Sorcim Corporation	6-8	482	Vertex System	386
*	Quine	450-451	419	Sourceware	635	502	Village Information Inc.	114
530	Rana System	589	*	Spinnaker Software	14-15	450	Virtual Combinatics	292
533	Rana System	589	582	SRA Inc.	263	469	Von Leivendyke	
741	Raytronics	516	583	SRA Inc.	265		Enterprises	45
387	Readi-Ware Systems	565	584	Standard Microsystems	636	473	Watsoft Products	677
388	Realia, Inc.	477	283	Starfire Games	157	474	Watsoft Products	359
363	Redding Group	728	378	Starfire Games	517	718	Western Union	66
731	Resolution Software	615	407	StarLogic	250	598	William Fink	360
600	Roston Publishing	609	396	Star Micronics, Inc.	538	510	Windmill Software	399
601	Roston Publishing	612	430	STB Systems Inc.	29	455	X-Comp	402
531	RKS Industries	514	*	Stone & Associates	506	458	X or Corp.	333
425	Robert J. Brady	202-203	585	Strategic Software Systems	655	458	X or Corp.	335
389	Rocky Mountain Micro	252	434	Strictly Software	607	381	XQ Software	17
432	Rocky Mountain Software		431	STSC Software	368	509	XY Quest Inc.	226
	Systems	383	586	Sundex Corp.	466	480	Your Business Software	356
438	RoseSoft	68	526	Sunword	459	470	Zee Programming	377

ELAN™ From TECMAR

The Most Powerful Local Area Network for the IBM PC

- Networking using Ethernet protocol
- Telephone support — autodial/autoanswer modem
- Voice recognition of commands and voice response
- Voice mail and messages
- Dictating system using Pearlcorder X-02 or XR from any telephone in the U.S.
- Complete software for written/voice mail, time management and audio/visual clock, calendar, and calculator functions
- Three ELAN Systems; the Secretary, the Manager and the Executive



The Executive

ELAN is designed to meet your total communications needs, including computer-to-computer (i.e., networking), person-to-computer, and person-to-person communication requirements for data and voice. The industry-standard high-speed Ethernet network protocol is employed in ELAN, permitting many IBM Personal Computers to be linked together by ordinary thin coaxial cable. In addition to his own computer, an ELAN system user can access the other devices attached to the cable — such as printers and large disks.

All versions of ELAN include an Ethernet interface with equipment to convert voice into data and back again. This enables the user to give and receive spoken messages from any location as well as store them for later use. In addition, with the Executive version, all ELAN software packages can be operated through verbal commands, through the telephone keypad or through the IBM PC keyboard. The computer can then respond verbally, either by telephone or "in person".

*ELAN (Extended Local Area Network) formerly ComNet



The Manager

The MANAGER system adds a modem for telephone communications and by adding a separate handset, permit voice communications. The modem enables the MANAGER to receive unattended voice and data from a telephone in the U.S. Also, the MANAGER can accept commands through decoding the tones from the telephone keypad.

The EXECUTIVE is the most complete implementation of ELAN, adding computer recognition of spoken commands. An executive might phone the PC to leave or retrieve messages or request specific information. The PC, in a spoken voice, can request a user's access code or prompt the user for a command. The executive can respond either by pushing buttons on the telephone, or by actually speaking back to the computer.

The SECRETARY is the basic ELAN system. It includes an Ethernet interface and all other ELAN features except modem and voice recognition.

Whether you choose the EXECUTIVE, MANAGER or SECRETARY, an ELAN system will improve your productivity and expand the versatility of your IBM PC.



TECMAR 6225 Cochran Road, Cleveland, Ohio 44139, P.O. Box 1000

CIRCLE #66 ON READER SERVICE CARD

Write or call Toll-free (800) 425-1535
U.S. residents call 914-425-1535

Shipping in U.S. areas:

• add \$5 to CANADA or MEXICO

• add \$5 to non U.S. areas

* add \$5 to CANADA or MEXICO

* add proper postage elsewhere

COPIES WELCOME

Specifications subject to change. Delivery subject to availability.

Trademark of IBM Corp. *OSBORNE is a trademark of Osborne Corp.

© 1987 Xerox Corp.

ELAN